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ABSTRACT

This teacher's guide is one of a series of publications focusing on the occupational preparation of persons with special education needs. The material was developed and tested by cooperating teachers over a period of three years. Task analysis information is presented using occupational descriptions from the Dictionary of Occupational Titles, covering entry level occupations generally available in Michigan. Instructional task modules are presented in detail under the headings: behavioral task knowledges/task skills, instructional methods, task-related competencies, instructional materials, basic information for cooperative teaching (language of the task and quantitative concepts), and suggestions. An instructional materials bibliography is included, followed by two appendixes, an instructional materials code indicating probable learning sensations, and a task-related competencies code. This guide describes 17 tasks common to the agriculture/natural resources cluster, 19 tasks for eight selected entry occupations in the agricultural mechanics subcluster, 8 tasks for six selected entry occupations in the landscaping and nursery subcluster, 11 tasks for four selected entry occupations in the greenhouse/floriculture subcluster, and 10 tasks for eight selected entry occupations in the forestry and recreation subcluster. (SA)

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Cluster Guide

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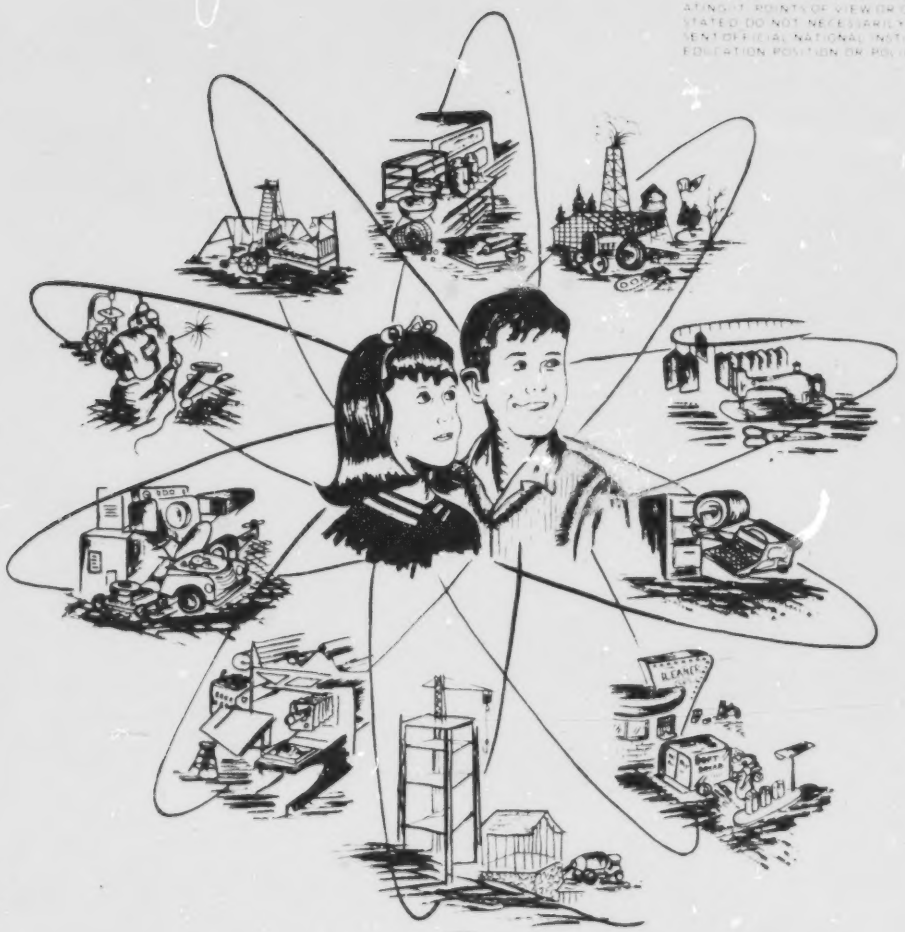

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...structional Resource Guide to Enhance Cooperative Vocational Education / Special Education Teaching

Agriculture / Natural Resources
CE 001 595

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AGRICULTURE/NATURAL RESOURCES

CLUSTER GUIDE

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PREFACE

This teacher's guide is one of a series of publications focusing upon the occupational preparation of persons with special education needs. It is intended to be used jointly by concerned teachers as they work collectively to serve students with unique educational problems. Developed and tested by cooperating teachers, these materials represent the culmination of three years of intensive listening, communication, cooperation, and positive action between vocational and special education teachers. If the exciting ideas in these pages are actively and cooperatively implemented, the impact upon our young people could well be tremendous.

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CONTENTS

PREFACE ii

ACKNOWLEDGEMENTS iii

TASK ANALYSIS INFORMATION

- Cluster Organization 1
- Clustered Occupations 2
- Dictionary of Occupational Titles 3
- Cluster Commonality Analysis 5
- Subcluster Commonality Analysis: Agricultural Mechanics 6
- Subcluster Commonality Analysis: Landscaping and Nursery 7
- Subcluster Commonality Analysis: Greenhouse/Floriculture 8
- Subcluster Commonality Analysis: Forestry and Recreation 9

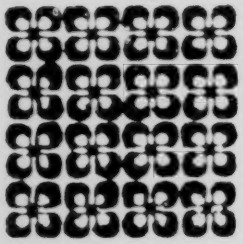
INSTRUCTIONAL TASK MODULES

- Common Cluster Tasks (CT) 11
- Subcluster: Agricultural Mechanics (AM) 49
- Subcluster: Landscaping and Nursery (LN) 89
- Subcluster: Greenhouse/Floriculture (GF) 107
- Subcluster: Forestry and Recreation (FR) 133

INSTRUCTIONAL MATERIALS BIBLIOGRAPHY 155

APPENDIX

- Instructional Materials Code 159
- Task-Related Competencies Code 161



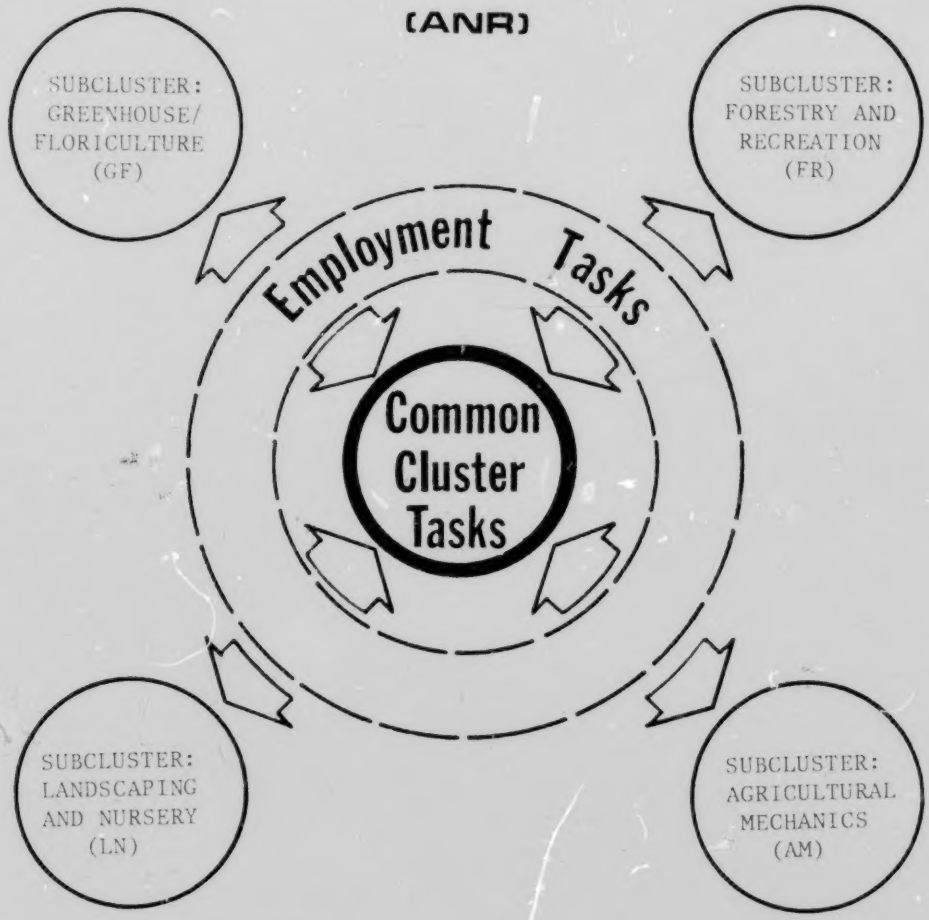
TASK ANALYSIS INFORMATION

AGRICULTURE/NATURAL RESOURCES CLUSTER

- CLUSTER ORGANIZATION
- CLUSTERED OCCUPATIONS
- DICTIONARY OF OCCUPATIONAL TITLES
- CLUSTER COMMONALITY ANALYSIS
- SUBCLUSTER COMMONALITY ANALYSIS: AGRICULTURAL MECHANICS
- SUBCLUSTER COMMONALITY ANALYSIS: LANDSCAPING AND NURSERY
- SUBCLUSTER COMMONALITY ANALYSIS: GREENHOUSE/FLORICULTURE
- SUBCLUSTER COMMONALITY ANALYSIS: FORESTRY AND RECREATION

CLUSTER ORGANIZATION

AGRICULTURE/NATURAL RESOURCES CLUSTER (ANR)



CLUSTERED OCCUPATIONS

CLUSTER: AGRICULTURE/NATURAL RESOURCES

OE PROGRAM CODE	SUBCLUSTER TITLE	D.O.T.	OCCUPATIONAL TITLES
01.0301	Agricultural Mechanics	409.883	Farm-Equipment Operator
		424.883	Heavy-Equipment Operator
		620.281	Tractor Mechanic
		620.884	Tractor-Mechanic Helper
		624.381	Farm Machinery Set-up Man
		*624.381	Farm-Equipment Mechanic
		624.781	Assembly Repairman
		624.884	Greaser
01.0504	Landscaping and Nursery	*407.884	Groundskeeper
		407.138	Greenskeeper
		406.887	Nursery Worker
		406.887	Bagger-and Burlap Man
		406.887	Groundman
		407.181	Landscape Gardener
01.0502	Greenhouse/Floriculture	406.181	Flower Grower
		142.081	Floral Designer
		260.458	Salesperson, Flowers
		289.358	Salesman, Florist Supplies
01.0601 01.0602 01.0703	Forestry and Recreation	*441.384	Forest Aid
		441.887	Forest-Fire Fighter
		*407.868	Park Caretaker
		*407.887	Park Worker
		449.887	Seed-Cone Picker
		449.287	Cruiser
		449.287	Logging Operations Inspector
		162.158	Field Man

*Key Analysis Occupation

DICTIONARY OF OCCUPATIONAL TITLES

The following is a list of occupational descriptions taken from the third edition (1965) of the Dictionary of Occupational Titles. These represent the key analysis occupations for the Agriculture/Natural Resources Cluster.

Each occupational title represents an entry-level occupation which is generally available (in demand) across the state of Michigan at the present time. However, teachers and curriculum planners must carefully study the generalizability of this information/data to their specific community. Local or regional manpower information and data must be carefully reviewed and analyzed in making decisions related to local vocational program offerings and specific curriculum or course content.

407.884 *GROUNDSKEEPER* Maintains grounds of industrial commercial, or public property, performing combination of following tasks: Cuts lawns, using hand mower or power mower. Trims and edges around walks, flower beds, and walls, using clippers and edging tools. Prunes shrubs and trees to shape and improve growth, using shears. Sprays lawns, shrubs, and trees with fertilizer and insecticide. Rakes and burns leaves and cleans or sweeps up litter, using spiked stick or broom. Shovels snow from walks and driveways. Plants grass, flowers, trees, and shrubs. Waters lawn and shrubs during dry periods, using hose or by activating fixed or portable sprinkler system. Repairs fences, gates, walls, and walks, using carpentry and masonry tools. Paints fences and outbuildings. Cleans out drainage ditches and culverts, using shovel and rake. Depending on size and nature of employing establishment, may operate tractor equipped with attachments, such as mowers, lime or fertilizer spreaders, and lawn roller.

407.887 *PARK WORKER* Keeps grounds of city, State, or national park clean and repairs buildings and equipment: Mows lawns, using hand mower or power driven lawnmower. Grubs and weeds around bushes, trees, and flower beds and trims hedges. Picks up and burns or carts away paper and rubbish. Repairs and paints benches, tables, guardrails, and assists in repair of roads, walks, buildings, and mechanical equipment, using handtools. Cleans comfort stations and other buildings.

624.381 *FARM-EQUIPMENT MECHANIC* Services, adjusts, and makes minor repairs on farm vehicles, machinery, and equipment, such as tractors, trucks, automobiles, harvesters, combines, silo fillers, plows, and similar equipment, using handtools: Observes and examines machinery and parts in operation to detect malfunctioning or defective units. Replaces components, such as carburetors, fuel pumps, generators, ignition points, spark plugs. Adjusts timing of motors, lubricates, washes, paints, and cleans vehicles and attachments, using handtools. May assist other workers in more complex maintenance tasks such as overhaul of machinery and equipment, repair and erection of buildings and structures, plumbing repair, and electrical work on farms.

441.384 *FOREST AID* Works alone or as member of crew to inventory, protect, and reforest timber lands performing any combination of the following duties: Observes, measures, and records forest data, such as tree species, volume of merchantable timber, topographical features, and tree seedling mortality. Measures and maps such areas as burns, cutover areas, experimental plots, and timber sales sections, using staff, compass and chain. Compiles data from recording or measuring instruments, such as rain gage, thermometer, stream flow recorder, and soil moisture gage. Participates in enforcement of recreation rules and regulations relating to parking, campfires, use of facilities and sanitation, to insure protection of picnic sites, camp grounds, and hunting and fishing areas. Answers questions on regulations, facilities, prevalence and types of wildlife and tree species. Performs seasonal tasks, such as planting trees, pruning and thinning trees to improve timber stands, patrolling area to detect and report fires and hazardous conditions, or leading crew to suppress forest fires.

407.868 *PARK CARETAKER* Performs following duties to facilitate maintenance and public enjoyment of city, State, or national parks: Furnishes public with information regarding rules and regulations of parks. Patrols grounds to detect fires and prevent infractions of rules. Directs Park Workers assigned to maintain and clean grounds, buildings, and comfort stations. May direct movement of traffic and parking of automobiles. May register campers and assign camping sites.

CLUSTER COMMONALITY ANALYSIS

AGRICULTURE/NATURAL RESOURCES CLUSTER

COMMON CLUSTER TASKS

SUBCLUSTERS (ANR)

INSTRUCTIONAL TASK MODULES	AGRICULTURE MECHANICS	FORESTRY AND RECREATION	LANDSCAPING AND NURSERY	GREENHOUSE/FLORICULTURE
CT01 Employ pest control measures		x	x	x
CT02 Propagate plants by budding and grafting		x	x	x
CT03 Plant annuals, and transplant seedlings, pot plants, shrubs, and trees		o	x	x
CT04 Plant watering		o	x	x
CT05 Control environmental factors influencing plant growth		o	x	x
CT06 Select and apply appropriate soil conditions		o	x	x
CT07 Operate and maintain chain saws	x	x	o	
CT08 Identify symptoms of pests affecting plants		o	x	x
CT09 Maintain and service lubrication systems	x	o	o	
CT10 Maintain and service fuel and carburetion systems	x	o	o	
CT11 Maintain and service batteries	x			o
CT12 Maintain and service drivelines	x			o
CT13 Identify trees		x	x	
CT14 Prune trees		x	x	
CT15 Repair bark damage		x	x	
CT16 Protect and treat damaged plants			x	x
CT17 Propagate plants from seed			x	x

x - essential
o - desirable

SUBCLUSTER COMMONALITY ANALYSIS

AGRICULTURAL MECHANICS

SELECTED ENTRY OCCUPATIONS

INSTRUCTIONAL TASK MODULES	FARM EQUIPMENT OPERATOR	HEAVY EQUIPMENT OPERATOR	TRACTOR MECHANIC	TRACTOR MECHANIC HELPER	FARM MACHINERY SET-UP MAN	FARM-EQUIPMENT MECHANIC	ASSEMBLY REPAIRMAN	GREASER
AM01 Assemble and perform basic machinery service	o		x	x	x	x	x	o
AM02 Lubricate agricultural equipment and machinery	x	x	x	x	x	x	x	x
AM03 Maintain and service hydraulic system components	o	o	x	x	o	x	x	o
AM04 Maintain and service tires	x	x	x	x	o	x	x	
AM05 Maintain and repair processing and storing equipment	o					x	x	
AM06 Maintain and service dusting, spraying, and fertilizing equipment	o					x	x	
AM07 Calibrate and service fertilizing equipment	x				o	x	x	
AM08 Maintain and repair tillage and planting machinery	o					x	x	
AM09 Maintain and repair crop harvesting equipment	o					x	x	
AM10 Tune and maintain tractors	o	o	x	o	x	x	x	
AM11 Maintain and service mechanical systems		o	x	o	o	x	x	o
AM12 Maintain and service cooling systems		o	x	o	o	o		
AM13 Maintain and service the ignition system		o	x	o		o		
AM14 Maintain and service brake systems		o	x	o	o	o		
AM15 Maintain and service cranking motor systems		o	x	o		o		
AM16 Maintain and service charging systems		o	x	o		o		
AM17 Maintain and service clutches		o	x	o	o	o		
AM18 Maintain and service differentials		o	x	o	o	o		
AM19 Maintain and service electrical system accessories	o	o	x	x	x	o		

x - essential
o - desirable

SUBCLUSTER COMMONALITY ANALYSIS

LANDSCAPING AND NURSERY

INSTRUCTIONAL TASK MODULES	SELECTED ENTRY OCCUPATIONS	GROUNDSKEEPER	GREENSKEEPER	NURSERY WORKER	BAGGER-and-BURLAP MAN	GROUNDMAN	LANDSCAPE GARDENER
LN01	Recognize plants by appearance, growth habits, and plant keys	x	o	x	x		x
LN02	Plan and establish a new lawn	o	x				x
LN03	Prepare soil mixtures	x	x	x		o	x
LN04	Prepare and apply soil mulches	x	x	x			x
LN05	Maintain and renovate lawns	x	x	o			x
LN06	Select plants for the landscape design	o	x	x		o	x
LN07	Plant plants in the landscape design	x	x	x	x	x	x
LN08	Maintain plants	x	x	x	x	x	x

x - essential
o - desirable

SUBCLUSTER COMMONALITY ANALYSIS

GREENHOUSE/FLORICULTURE

INSTRUCTIONAL TASK MODULES	FLOWER GROWER	FLORAL DESIGNER	SALESPERSON, FLOWERS	SALESMAN, FLORIST SUPPLIES
GF01 Identify common cut flowers	x	x	x	x
GF02 Identify common flowering pot plants	x	x	x	x
GF03 Identify common foliage plants and florist greens	x		x	x
GF04 Apply the principles of design to flower arranging		x	o	
GF05 Select floral holding devices, containers, and supplies		x	o	x
GF06 Prepare home and hospital arrangements		x	o	
GF07 Prepare wedding floral arrangements		x	o	
GF08 Prepare funeral floral arrangements		x	o	
GF09 Decorate a flowering pot plant		x	x	
GF10 Propagate plants from cuttings	x	o		
GF11 Propagate plants by layerage	x	o		

SELECTED ENTRY OCCUPATIONS

x - essential
o - desirable

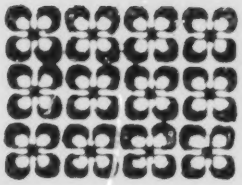
SUBCLUSTER COMMONALITY ANALYSIS

FORESTRY AND RECREATION

SELECTED ENTRY OCCUPATIONS

INSTRUCTIONAL TASK MODULES	FOREST AID	FOREST-FIRE FIGHTER	PARK CARETAKER	PARK WORKER	SEED-CONE PICKER	CRUISER	LOGGING OPERATIONS INSPECTOR	FIELD MAN
FR01 Establish a woodland	o	o	x	x	o	x	o	o
FR02 Thin a tree stand	o	o	x	x		x	o	o
FR03 Improve a tree stand	o	o	x	x		x	o	o
FR04 Identify insect and disease damage	x		x	x	x	x	x	x
FR05 Use and field service forestry tools	x	x	x	x	x	x	x	x
FR06 Harvest stands	o	x			o	x	o	o
FR07 Cruise and measure a stand	x				o	x	x	x
FR08 Produce and harvest Christmas trees	o							o
FR09 Cut and prepare pulp wood						x	o	x
FR10 Identify forest management services	x	o	o	x		o	x	x

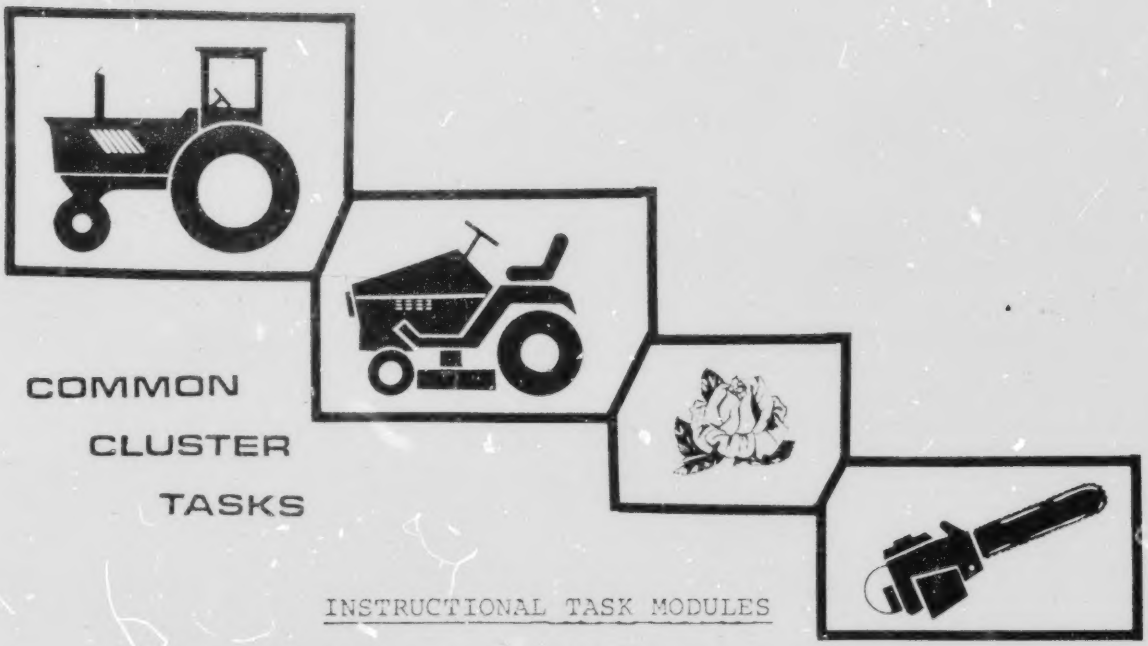
x - essential
o - desirable



INSTRUCTIONAL TASK MODULES

AGRICULTURE / NATURAL RESOURCES CLUSTER

- COMMON CLUSTER TASKS (CT)
- SUBCLUSTER: AGRICULTURAL MECHANICS (AM)
- SUBCLUSTER: LANDSCAPING AND NURSERY (LN)
- SUBCLUSTER: GREENHOUSE/FLORICULTURE (GF)
- SUBCLUSTER: FORESTRY AND RECREATION (FR)



COMMON CLUSTER TASKS

INSTRUCTIONAL TASK MODULES

CT01 Employ pest control measures

CT02 Propagate plants by budding and grafting

CT03 Plant annuals, and transplant seedlings, pot plants. shrubs, and trees

CT04 Plant watering

CT05 Control environmental factors influencing plant growth

CT06 Select and apply appropriate soil conditions

CT07 Operate and maintain chain saws

CT08 Identify symptoms of pests affecting plants

CT09 Maintain and service lubrication systems

CT10 Maintain and service fuel and carburetion systems

CT11 Maintain and service batteries

CT12 Maintain and service drivelines

CT13 Identify trees

CT14 Prune trees

CT15 Repair bark damage

CT16 Protect and treat damaged plants

CT17 Propagate plants from seed

COMMON CLUSTER TASKS

TASK: Employ pest control measures

Code: [illegible] - [illegible]

Student Name: _____

Student Progress				Behavioral Task Knowledges/Task Skills
Introduced	Involved	Productive	Employable	
				Given the necessary tools, materials, equipment, and requisite knowledge, the learner will: 1. identify the different chemicals used in controlling plant pests. 2. list and demonstrate the different methods of treating plant with herbicides and fungicides. 3. list and demonstrate the different methods of applying insecticides. 4. operate spraying and dusting pest control equipment. 5. identify and demonstrate two mechanical methods of pest control. 6. recognize and observe several specific safety precautions in handling and employing pest control measures.

Instructional Methods

- Students review pamphlets supplied by insecticide manufacturers.
- Teacher provides individual student demonstrations on use and application of insecticides.
- Teacher should relate pest control to seasonal needs.
- Teacher matches successful students who are interested in helping those having difficulty.

Task-Related Competencies	Instructional Materials		
	Title	Media	Bib.
KNOWLEDGE A 7 NUMBERS B 2b,4b,c,5 APPLICATION C 5,8 PHYSICAL D 1,2d,3	Diseases and Pests of Ornamental Plants	14	21

COMMON CLUSTER TASKS

Code: ANR - CT01 TASK: Employ pest control measures

Basic Information for Cooperative Teaching		Suggestions:
Language of the Task	Quantitative Concepts	
Spraying Dusting dust powder smoke Applicator - sprayer Residue Concentration Respirator (Mask) Dilution Bomb - aerosol Ratio Pesticides Caution! Warning!	Ratio of concentrate to water i.e. 1 part c/10 pints water 1 drop/gallon Best method- parts per million ppm.	• Buy a pack of koolaid and mix to specifications. • Ask Vocational Education instructor for charts or information related to ppm.

Supportive Instructional Materials:

Consult Vocational Education instructor for Safety Practices.
Resource person who can bring home the message of Safety in Handling the sprays,dusts,etc.

COMMON CLUSTER TASKS

TASK: Propagate plants by budding and grafting

Code: ANR - CT02

Student Name: _____

Student Progress					Behavioral Task Knowledges/Task Skills	Instructional Methods
Introduced	Involved	Productive	Employable		Given the necessary tools, materials, equipment, and requisite knowledge, the learner will: 1. identify and describe the different grafting processes. 2. identify and describe the different budding processes. 3. select the appropriate tools for budding and grafting. 4. demonstrate the procedures for selected budding and grafting processes. 5. recognize plants lending themselves to grafting techniques. 6. demonstrate the procedures for caring for plants after budding and grafting. 7. select and properly store scion wood. 8. prepare and apply grafting waxes.	• Teacher provides demonstration of specific budding and grafting techniques. • Teacher matches successful students who are interested in helping those having difficulty.

Task-Related Competencies	Instructional Materials		
	Title	Media	Bib.
KNOWLEDGE A 7,9	Tools for grafting/budding	1	
NUMBERS 3 2b	"Budding and Grafting"	10	18
	"Plant Propagation"	13	5
APPLICATION C 4,5,8			
PHYSICAL D 1c,d,2b,3c,e,f			

COMMON CLUSTER TASKS

Code: ANR - CT02 TASK: Propagate plants by budding and grafting

Basic Information for Cooperative Teaching		Suggestions:
Language of the Task	Quantitative Concepts	• Check closely with Vocational Agriculture instructor to determine his need for supportive teaching.
Grafting Budding Knives Cambium layer Scion wood	Understand the need for sequencing	

Supportive Instructional Materials:

COMMON CLUSTER TASKS

TASK: Plant annuals, and transplant seedlings, pot plants, shrubs, and trees

Code: ANR - CT03

Student Name: _____

Student Progress				Behavioral Task Knowledges/Task Skills	Instructional Methods
Introduced	Involved	Productive	Employable	Given the necessary tools, materials, equipment, and requisite knowledge, the learner will: 1. identify and demonstrate the use of specific tools and equipment needed for planting and transplanting. 2. identify the proper spacing for specific plants in the landscape. 3. demonstrate the care and handling techniques for shipment packing, temporary storage, and unpacking. 4. plant/transplant each of the following by following prescribed procedures or techniques: a. potting plants b. shrubs c. seedlings d. trees e. annuals.	• Students plant flowers around the school in beds. • Students transplant tomatoes grown at school to their home garden or to the home of an elderly couple. • Students participate in landscaping the building trades home. • Teacher makes contact with each student during the class period. • Teacher encourages small peer group cooperation and interaction.

Task-Related Competencies	Instructional Materials		
	Title	Media	Bib.
KNOWLEDGE A 3,8,9 NUMBERS B 2b,4a APPLICATION C 5,6,8 PHYSICAL D 1a,b,c,d,2e, 3c,d,e,f,g	Commercial Flower Forcing	13	14

COMMON CLUSTER TASKS

Code: ANR - CT03 TASK: Plant annuals, and transplant seedlings, pot plants, shrubs, and trees

Basic Information for Cooperative Teaching		Suggestions:
Language of the Task	Quantitative Concepts	• Collect magazines illustrating landscaping examples.
Shovel Hoe Rake Hose Braker Stake Wheelbarrow Pots and large containers Burlap Annuals Perennials	Balance Appearance Feet Yards Inches Harmony	

Supportive Instructional Materials:

COMMON CLUSTER TASKS

TASK: Plant watering

Code: ANR - CT04

Student Name: _____

Student Progress					Behavioral Task Knowledges/Task Skills	Instructional Methods
Introduced	Involved	Productive	Employable		Given the necessary tools, materials, equipment, and requisite knowledge, the learner will: 1. recognize and describe the importance of soil water to plants. 2. describe and demonstrate techniques of watering plants without over-watering or under-watering. 3. describe and demonstrate techniques for improving the water holding capacities of specific soils. 4. demonstrate a degree of skill in operating plant watering equipment.	• Teacher organizes a field trip to a local golf course to observe and discuss irrigation system. • Teacher presents a demonstration of hand watering, semi-automatic watering, and automatic watering systems. • Students view slides and film of different watering setups. • Para-professionals provide sustained involvement with students having difficulty with this task. • Teacher encourages small peer group cooperation and interaction.

Task-Related Competencies	Instructional Materials		
	Title	Media	Bib.
KNOWLEDGE A 9	"Fertilizing and Watering Shade and Ornamental Trees"	14	25
NUMBERS B 2b,4a,c,d,f	"Irrigation and the Business of Farming"	8	9
APPLICATION C 4,8	"Greenhouse Crop Production"	14	17
PHYSICAL D 1a,c,d,f,2b,3g			

COMMON CLUSTER TASKS

Code: ANR - CT04 TASK: Plant watering

Basic Information for Cooperative Teaching		Suggestions:
Language of the Task	Quantitative Concepts	
Soil water Water holding capacity Hose Breaker Watering can Mist Sprinkler Soaker	Measure the amount of water that flows through a given size hose over a given period of time.	• To fully become aware of what soil water is in relation to standing water: 1. demonstrate water seepage through soil as it would relate to seepage action into natural ground soil. 2. demonstrate standing water in a soil situation where water does not have natural drainage and therefore does not seep away but stands in an area of soil • Take glass, pots, or containers and have soil mixture approximate soil with adequate drainage to demonstrate action of soil water seepage. Then plant seeds of tomato and observe germination of seed and eventual growth. Next, take pot and soil mixture that would create condition of soil that does not have natural drainage and so as to effect condition displaying standing water, this condition would cause seed to either rot or not allow plant growth because standing water would actually drown roots.

Supportive Instructional Materials:

COMMON CLUSTER TASKS

TASK: Control environmental factors influencing plant growth

Code: ANR - CT05

Student Name: _____

Student Progress					Behavioral Task Knowledges/Task Skills
Introduced	Involved	Productive	Employable		Given the necessary tools, materials, equipment, and requisite knowledge, the learner will: 1. identify and describe the influences of environmental factors upon plant growth: a. temperature b. moisture c. aeration d. location e. light f. soil g. relative humidity. 2. select and regulate specific environmental factors to influence plant growth in a positive manner.

Instructional Methods

- Teacher provides demonstration on controlling conditions in greenhouse.
- Teacher organizes field trip to greenhouse to view techniques of environment regulation.
- Teacher encourages small peer group cooperation and interaction.
- Para-professionals provide sustained involvement with students having difficulty with this task.

Task-Related Competencies	Instructional Materials		
	Title	Media	Bib.
KNOWLEDGE A 9	"Commercial Flower Forcing"	13	14
NUMBERS B 4f	Ball Red Book	13	26
APPLICATION C 4,5,8			
PHYSICAL D 1c,2a			

COMMON CLUSTER TASKS

Code: ANR - CT05 TASK: Control environmental factors influencing plant growth

Basic Information for Cooperative Teaching		Suggestions:
Language of the Task	Quantitative Concepts	
Temperature Moisture Aeration Light Soil Conservation Photoperiod	Read temperature thermometer (°F), water gauge, and moisture testing equipment.	

Supportive Instructional Materials:

Examples of gauges, thermometers, etc.

COMMON CLUSTER TASKS

TASK: Select and apply appropriate soil conditioners

Code: ANR - CT06

Student Name: _____

Student Progress					Behavioral Task Knowledges/Task Skills	Instructional Methods
Introduced	Involved	Productive	Employable		Given the necessary tools, materials, equipment, and requisite knowledge, the learner will: 1. identify and describe the common soil conditioners. 2. list the advantages of using conditioners. 3. recognize the procedures for application of conditioners. 4. mix and prepare soil mixtures with specific characteristics for a given application. 5. apply prepared soil mixtures following prescribed procedures.	• Students work in seedbeds, experimenting with the use of soil conditioners. • Students organize a field trip to greenhouse to observe the application of soil conditioners. • Teacher encourages small peer group cooperation and interaction. • Para-professionals provide sustained involvement with students having difficulty with this task. • Students review appropriate sections of illustrated workbook manual.

Task-Related Competencies	Instructional Materials		
	Title	Media	Bib.
KNOWLEDGE A 9 NUMBERS B 2b,4b,5 APPLICATION C 5 PHYSICAL D 1d,f,2e,3c, d,e,f,g	Turf Maintenance and Establishment	14	17

COMMON CLUSTER TASKS

Code: ANR - CT06 TASK: Select and apply appropriate soil conditioners

Basic Information for Cooperative Teaching		Suggestions:
Language of the Task	Quantitative Concepts	
Soil conditioner Vermiculite	Add soil conditioners to soil for specific plantings.	• Special emphasis given to soil conditioner supplements for desired growth of plantings and maintenance of correct moisture content in the soil for the planting. • Construct a potting table with attached bins for specific soils and selected conditioners. • Know soil needs for specific plants and amount of added vermiculite for best growth patterns for plantings. • Know how to obtain soil conditions locally or procedure of obtaining specific conditioners from bulk storage.

Supportive Instructional Materials:

COMMON CLUSTER TASKS

Sheet 1 of 1

TASK: Operate and maintain chain saws

Code: [illegible] - CT[illegible]

Student Name: _____

Student Progress				Behavioral Task Knowledges/Task Skills
Introduced	Involved	Productive	Employable	

Given the necessary tools, materials, equipment, and requisite knowledge, the learner will:

1. identify the exterior parts of a chain saw.
2. properly prepare and fuel a chain saw.
3. follow a prescribed procedure in starting a chain saw.
4. provide general care and maintenance for the chain saw.
   a. sharpen chain
   b. adjust chain tension
   c. oil chain
   d. maintain oil level
   e. clean air filter
   f. prepare the chain saw for storage.
5. properly operate the chain saw for:
   a. limbing
   b. pruning
   c. bricking
   d. felling.
6. demonstrate proper safety procedures in operating and handling a chain saw.
7. describe and demonstrate the proper procedures for operating a chain saw in the forest.

Instructional Methods

- Local chain saw dealer speaks to class on saw maintenance and use.
- Teacher provides a demonstration of operation and maintenance procedures/techniques.
- Students must be reminded to wear hard hats and safety glasses.
- Teacher provides one-to-one instruction on use of equipment.
- Para-professionals provide sustained involvement with students having difficulty with this task.

Task-Related Competencies	Instructional Materials: Title	Media	Bib.
KNOWLEDGE [illegible] 7,[illegible]	lightweight late model chainsaw(s)	1	
NUMBERS [illegible] 4a,c	owner's manual for saws being used	14	
APPLICATION [illegible] 5,[illegible]			
PHYSICAL [illegible] 1a,d,e,2c, 3a,c			

COMMON CLUSTER TASKS

Code: A-8 - CT-7 TASK: Operate and maintain chain saws

Basic Information for Cooperative Teaching		Suggestions:
Language of the Task	Quantitative Concepts	• Contact the Vocational Agriculture instructor and determine the need for supportive teaching
Fuel mixture	1/2 pt. oil per one gallon of gas	
Safety		
Chain		
Chain tension		
Air filter		
Limbing		
Pruning		
Felling		

Supportive Instructional Materials:

COMMON CLUSTER TASKS

TASK: Identify symptoms of pest affecting plants

Code: AGR - CPDS

Student Name: _____

Student Progress				Behavioral Task Knowledges/Task Skills	Instructional Methods
Introduced	Involved	Productive	Employable	Given the necessary tools, materials, equipment, and requisite knowledge, the learner will: 1. identify by name several common plant pests. 2. recognize symptoms of plant attack by pests.	• Students visit a greenhouse and/or nursery lo to examine symptoms of pest damage. • Students view filmstrip, and review illustrated sections of the insect identification manual. • Teacher encourages small peer group cooperation and interaction.

Task-Related Competencies	Instructional Materials		
	Title	Media	Bib.
KNOWLEDGE	Insect Identification Manual	M	18
NUMBERS	Controlling Pests of rnamental Plants	P	18
APPLICATION			
PHYSICAL			

COMMON CLUSTER TASKS

Code: A-7 - LTDB TASK: Identify symptoms of pests affecting plants

Basic Information for Cooperative Teaching		Suggestions:
Language of the Task	Quantitative Concepts	• Visit a greenhouse and/or a nursery.
Chlorosis (yellowing) Mottle Insects (white flies) Disease (virus) Rotting Fungus Stunting Deforming Aphids		

Supportive Instructional Materials:

Pictures, plants, etc.

COMMON CLUSTER TASKS

TASK: Maintain and service lubrication syster

Code: AMR - CP08

Student Name: _____

Student Progress				Behavioral Task Knowledges/Task Skills	Instructional Methods
Introduced	Involved	Productive	Employable	Given the necessary tools, materials, equipment, and requisite knowledge, the learner will: 1. identify and describe the basic operation and function of the lubrication system. 2. recognize and observe specific safety precautions relating to the maintenance and service of the lubrication system. 3. perform the following job skills with accuracy to meet the accepted manufacturer's specification: a. change engine oil and filter b. clean, repack and adjust front wheel bearings c. check and correct vital fluid levels: differentials, brake, transmission, engine following manufacturer's specifications or recommendation d. check oil level and adjust if necessary e. air over oil engine lubrication check.	• Teacher demonstrates the identified job skills, using transpariencies. • Students will be involved in maintenance and service of the lubrication system - performing the identified job skills. • Students check service manuals to determine recommended oil and lubrication grades for specified engines. • Teacher encourages small peer group cooperation and interaction.

Task-Related Competencies	Instructional Materials		
	Title	Media	Bib.
KNOWLEDGE A 7,8,9	Service manuals	1	
NUMBERS B 2a,b,4b,c,f,5	Teacher made slides	4	
APPLICATION C 3,5,6,7,8	"Lubrication and Cooling Systems"	5	22
PHYSICAL D 2b,3a,c,e,f,g			

COMMON CLUSTER TASKS

Code: [illegible] - [illegible] TASK: Maintain and service lubrication system

Basic Information for Cooperative Teaching		Suggestions:
Language of the Task	**Quantitative Concepts**	
Oil Grease Lubrication Bearings Fluid Quart Zerk Half-quarts Oil Weights: 1. 20-20 2. 20-30 3. 10w-30 etc.	Relate correlation of 1. quarts 2. pints 3. gallons	• Test tubes with common weight of oil drop [illegible] into oil and time period of [illegible] setting to bottom of test tube. • Have quart, gallon, cup, teaspoon, 5 gallon containers visable for measurement relationship. • List word v.s. abbreviations and discuss them. • Tie in math relation in using a stop watch to measuring [illegible]-setting time. • Make word flash cards and place with objects demonstration.

Supportive Instructional Materials:

COMMON CLUSTER TASKS

TASK: Maintain and service fuel and carburetion system

Code: AMR - CT10

Student Name: _____

Student Progress				Behavioral Task Knowledges/Task Skills	Instructional Methods
Introduced	Involved	Productive	Employable	Given the necessary tools, materials, equipment, and requisite knowledge, the learner will: 1. identify the basic principles of operation for the fuel system and carburetion components. 2. recognize and observe specific safety precautions related to the maintenance and service of fuel and carburetion systems. 3. perform the following job skills with accuracy to meet the accepted manufacturer's specifications: a. check, clean and/or replace fuel filter b. adjust idle speed c. check, clean, and/or replace sediment bowl d. check, clean and/or replace air cleaning system (dry filter and oil bath) e. adjust main load setting.	• Teacher makes contact with each student during the class period. • Students will be involved in maintaining and servicing components of the fuel and carburetion systems-performing identified job skills. • Teacher provides a demonstration of the job skills using transparencies and mockups. • Teacher encourages small peer group cooperation and interaction.

Task-Related Competencies	Instructional Materials		
	Title	Media	Bib.
KNOWLEDGE A 2,3,7,8,9 NUMBERS B 2a,b,4c,f, i,5 APPLICATION C 3,5,6,8 PHYSICAL D 1a,b,c,d,f, 2a,b,3b,c,g	DCA transparencies - Group I Fuel System Teacher-constructed mockups	12 2	6

COMMON CLUSTER TASKS

Code: AMR - CT10 TASK: Maintain and service fuel and carburetion systems

Basic Information for Cooperative Teaching		Suggestions:
Language of the Task	Quantitative Concepts	
Carburetor bowl Float system Idling system High speed jets Venturi Air bleed valves	Principle of pressure Venturi Recognize fuel/air ratios	

Supportive Instructional Materials:

COMMON CLUSTER TASKS

TASK: Maintain and service batteries

Code: ANR- CT11

Student Name: _____

Student Progress				Behavioral Task Knowledges/Task Skills	Instructional Methods
Introduced	Involved	Productive	Employable	Given the necessary tools, materials, equipment, and requisite knowledge, the learner will: 1. identify and describe the function of each of the component parts of a battery. 2. identify and describe the applications or uses of different types of batteries. 3. recognize and observe specific safety precautions relating to servicing batteries. 4. perform the following job skills with accuracy to meet the accepted manufacturer's specifications: a. check electrolyte level of battery cells and adjust to proper level b. charge a battery according to specifications c. connect booster cable properly d. perform visual inspection of battery condition e. install a battery in the vehicle with proper connections f. clean battery and terminals g. determine the characteristics commonplace to defective batteries.	• Students are involved in the actual servicing of batteries performing the identified job skills. • Teacher uses charts, mock-ups, and transparencies to reinforce battery service concepts and principles in lectures and demonstrations. • Teacher encourages small peer group cooperation and interaction. • Teacher makes contact with each student during the class period.

Task-Related Competencies	Instructional Materials		
	Title	Media	Bib.
KNOWLEDGE A 2,3,7,8,9 NUMBERS B 2a,b,4c,d, f,h,5,6 APPLICATION C 3,5,6,8 PHYSICAL D 1a,b,c,d,f, 2b,3c	Mockups cutaway of battery Delco-Remy charts Transparencies on Battery Construction and Operation	2 16 12	

COMMON CLUSTER TASKS

Code: ANR - CT11 TASK: Maintain and service batteries

Basic Information for Cooperative Teaching		Suggestions:
Language of the Task	Quantitative Concepts	
Terminal Plate Charge indicator Booster cable (jumper cable) Visual inspection Electrolyte	How to read an electrolyte (Hydrometer) as to acid content and relationship to battery life.	• Visualization of actual battery with word-object card association for labeling of battery components. Ex: terminal, plates. • Proper procedure of hooking up charge indicator to positive and negative terminals to evaluate charge of battery before and after charge remediation. • Knowing sequential order of hooking up booster cable to correct terminals and awareness of possible color coding of cable clamps. Red for positive terminal association and Black for negative correlation. • Know how to clean a battery with baking soda solution and wire brush application to terminal refurbishing. • Using a cloth towel to assimulate damage of acid action to: clothing, skin or eye damage and immediate first aid application if acid contact arises with clothing or anatomical contact.

Supportive Instructional Materials:

COMMON CLUSTER TASKS

TASK: Maintain and service drivelines

Code: AMR - CT12

Student Name: _____

Student Progress				Behavioral Task Knowledges/Task Skills
Introduced	Involved	Productive	Employable	Given the necessary tools, materials, equipment, and requisite knowledge, the learner will: 1. identify and describe the function of the component parts of the driveline. 2. recognize and observe safety precautions in servicing drivelines. 3. perform the following job skills with accuracy to meet the accepted manufacturer's specification: a. remove and replace driveline.

Instructional Methods

- Students will be involved in the maintenance and service of drivelines-performing the identified job skills.
- Teacher demonstration of job skills using mockups, tranparencies, and charts.
- Para-professionals provide sustained involvement with students having difficulty with this task.
- Teacher encourages small peer group cooperation and interaction.

Task-Related Competencies	Instructional Materials		
	Title	Media	Bib.
KNOWLEDGE A 3,7,8	"Universal Joint" (teacher-prepared)	12	
NUMBERS B 2a,b,4b,c,f, 5	"Propeller Shafts, Wheels & Tires"	5	
APPLICATION C 3,5,6,7,8	Mockup of driveshaft and universal joint	2	
PHYSICAL D 1a-f,2b,c,d, 3a,c,e,f,g			

COMMON CLUSTER TASKS

Code: ANR - CT12 TASK: Maintain and service drivelines

Basic Information for Cooperative Teaching		Suggestions:
Language of the Task	Quantitative Concepts	• Drawings and overlays may be used to show how driveline converts torque from engine to turning power at rear wheels.
Transmissions Input shaft Output shaft Ring gears Pinion gears Spider gears Differential carrier	The operation of transmission and differential must be understood to show how tractor can turn and one wheel go faster than the other. Ratio relationships Speeds Gear ratios Relate problems to practical occupational needs.	

Supportive Instructional Materials:

COMMON CLUSTER TASKS

TASK: Identify trees

Code: ANR - CT13

Student Name: _____

Student Progress				Behavioral Task Knowledges/Task Skills	Instructional Methods
Introduced	Involved	Productive	Employable	Given the necessary tools, materials, equipment, and requisite knowledge, the learner will: 1. identify the parts of the crown and their function: a. leaves b. buds c. twigs d. flowers e. seeds. 2. identify the parts of the trunk and their function: a. outer b. cambium c. sapwood or xylem d. heartwood. 3. identify the parts of the root system and their function: a. root hairs b. root tips. 4. describe the budding process and phases of tree growth. 5. describe the effect of environmental factors upon tree growth: a. moisture b. temperature c. light d. soil.	• Teacher directs classroom discussion, using basic botany or biology text. • Students take a field trip around school grounds to discuss and identify the different trees. • Teacher encourages small peer group cooperation and interaction.

Task-Related Competencies	Instructional Materials		
	Title	Media	Bib.
KNOWLEDGE A 5,6,9 NUMBERS B 2b APPLICATION C 2,6 PHYSICAL D 1a,2a	Jr. High Botany or Biology text	13	

COMMON CLUSTER TASKS

Code: AHR - CT13 TASK: Identify trees

Basic Information for Cooperative Teaching			Suggestions:
Language of the Task		Quantitative Concepts	
Cambium	Hardwood	Match correlating name with tree by number or other code.	
Xylem	Softwood		
Heartwood	Broadleaf		
Root			
Trunk			
Crown			
Leaves			
Twig			
Leaf scars			
Bark			
Flower			
Fruit			
Conifers			
Evergreen			
Decidious			

Supportive Instructional Materials:

COMMON CLUSTER TASKS

TASK: Identify trees

Code: ANR - CT13 cont.

Student Name: _____

Student Progress					Behavioral Task Knowledges/Task Skills	Instructional Methods
Introduced	Involved	Productive	Employable		Given the necessary tools, materials, equipment, and requisite knowledge, the learner will: 6. classify trees by: a. conifers/broadleaf b. evergreen/deciduous c. hardwoods/softwoods. 7. identify trees by recognizing specific characteristics of: a. general form of the tree b. leaves c. twigs and leaf scars d. bark e. buds f. flowers g. fruit.	

Task-Related Competencies	Instructional Materials		
	Title	Media	Bib.
KNOWLEDGE			
NUMBERS			
APPLICATION			
PHYSICAL			

COMMON CLUSTER TASKS

Code: ___ - ____ TASK:

Basic Information for Cooperative Teaching		Suggestions:
Language of the Task	Quantitative Concepts	

Supportive Instructional Materials:

COMMON CLUSTER TASKS

TASK: Prune trees

Code: AMR - CT14

Student Name: _____

Student Progress				Behavioral Task Knowledges/Task Skills	Instructional Methods
Introduced	Involved	Productive	Employable	Given the necessary tools, materials, equipment, and requisite knowledge, the learner will: 1. describe reasons for pruning trees. 2. follow a prescribed procedure for pruning limbs with a pruning saw. 3. prevent bark peeling damage to tree trunk or limb.	• Teacher and/or professional demonstrates methods for Christmas tree pruning, orchard pruning, timber pruning, landscape pruning. • Student review illustrated manuals and texts on pruning. • Teacher encourages small peer group cooperation and interaction. • Para-professionals provide sustained involvement with students having difficulty with this task.

Task-Related Competencies	Instructional Materials		
	Title	Media	Bib.
KNOWLEDGE A 7,9	Forest Management Pamphlets MSU Extension Service	14	28
NUMBERS	The Pruning Manual	13	24
APPLICATION C 5,8	How to Prune Almost Everything	14	23
PHYSICAL D 1a,e,2d,3a,c			

COMMON CLUSTER TASKS

Code: AHR - CT14 TASK: Prune trees

Basic Information for Cooperative Teaching		Suggestions:
Language of the Task	Quantitative Concepts	• A walk around residential or landscaped public area would reinforce the need for and/or advantages of pruning.
Pruning Shaping Fruit yield Deadwood Saw Pruning paint or Asphalt paint		

Supportive Instructional Materials:

COMMON CLUSTER TASKS

TASK: Repair bark damage

Code: ANR - CT15

Student Name: _____

Student Progress	Behavioral Task Knowledges/Task Skills	Instructional Methods
Introduced / Involved / Productive / Employable	Given the necessary tools, materials, equipment, and requisite knowledge, the learner will: 1. describe the need to repair bark damage. 2. trim the opening in the bark to an elliptical form. 3. paint with tree wound paint or asphalt paint. 4. nail loose bark to prevent its separating from tree.	• Teacher and students conducting walking tour of school grounds to check for bark damage to trees. • Teacher encourages small peer group cooperation and interaction. • Teacher matches successful students who are interested in helping those having difficulty. • Students organize a class project for repairing bark damage to trees in the community.

Task-Related Competencies	Instructional Materials		
	Title	Media	Bib.
KNOWLEDGE A 6,9 NUMBERS B APPLICATION C 5,8 PHYSICAL D 1a,c,d,2c,3a, b,c,	Tree Maintenance	13	4

COMMON CLUSTER TASKS

Code: AHR - CT15 TASK: Repair bark damage

Basic Information for Cooperative Teaching		Suggestions:
Language of the Task	Quantitative Concepts	• Take a field trip and observe examples of bark repair or bark damage.
Repair Elliptical Damage Bark Asphalt Wound		

Supportive Instructional Materials:

COMMON CLUSTER TASKS

TASK: Protect and treat damaged plants

Code: AHR - CT16

Student Name: _____

Student Progress					Behavioral Task Knowledges/Task Skills	Instructional Methods
Introduced	Involved	Productive	Employable		Given the necessary tools, materials, equipment, and requisite knowledge, the learner will: 1. identify by name different parts of plants. 2. recognize different types of plant damage. 3. list and demonstrate methods of protecting different types of plants from weather damage. 4. demonstrate the basic techniques for treating wounds. 5. demonstrate the basic techniques for treating cavities. 6. apply the appropriate dressings for plant wounds.	• Students view a teacher-prepared set of slides illustrating techniques for protecting/treating damaged plants. • Students demonstrate the basic techniques for protecting/treating plants that have been weather damaged. • Teacher encourages small peer group cooperation and interaction. • Para-professionals provide sustained involvement with students having difficulty with this task.

Task-Related Competencies	Instructional Materials		
	Title	Media	Bib.
KNOWLEDGE A 2	slides (teacher-prepared)	11	
NUMBERS			
APPLICATION C 3			
PHYSICAL			

COMMON CLUSTER TASKS

Code: ANR - CT16 TASK: Protect and treat damaged plants

Basic Information for Cooperative Teaching		Suggestions:
Language of the Task	**Quantitative Concepts**	• Consult with vocational instructor for examples.
Root Leaf Stem Flower Insect Disease Plant dressings Wounds	Recognize and interpret: ounces pints quarts gallons liquids /dry weights diluting ratios teaspoon tablespoon cup	

Supportive Instructional Materials:

Scales, cups, teaspoons, charts, other volume measuring devices

COMMON CLUSTER TASKS

TASK: Propagate plants from seed

Code: AAR - CX17

Student Name: _____

Student Progress				Behavioral Task Knowledges/Task Skills	Instructional Methods
Introduced	Involved	Productive	Employable	Given the necessary tools, materials, equipment, and requisite knowledge, the learner will: 1. identify and describe the parts of seeds. 2. select the proper storage conditions for given seeds. 3. interpret information contained on seed packages. 4. recognize and observe specific safety precautions related to the chemical treatment of seeds. 5. exhibit a degree of skill in plant seeds under appropriate soil conditions.	• Students plant seeds in prepared flats. • Teacher provides a demonstration of procedures/techniques for planting seeds. • Teacher encourages small peer group cooperation and interaction. • Teacher catches successful students who are interested in helping those having difficulty. • Para-professionals provide sustained involvement with students having difficulty with this task.

Task-Related Competencies	Instructional Materials		
	Title	Media	Bib.
KNOWLEDGE 1,9	Small Seed Lab	13	26
NUMBERS 4a,5			
APPLICATION 2,3,6,7			
PHYSICAL 1d,2b,3b,c,d,e,f,g			

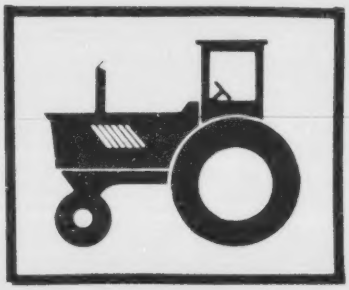
COMMON CLUSTER TASKS

Code: ANR - CT17 TASK: Propagate plants from seed

Basic Information for Cooperative Teaching		Suggestions:
Language of the Task	Quantitative Concepts	• A field trip to a greenhouse could add interest and understanding for the need of careful work.
Depth Spacing Temperature Moisture Waterings Light v.s. Dark Storage Humidity Fungicides Seed coats	Recognize and interpret: inches feet yards degrees (°F)	

Supportive Instructional Materials:

AGRICULTURAL MECHANICS



INSTRUCTIONAL TASK MODULES

AM01 Assemble and perform basic machinery service

AM02 Lubricate agricultural equipment and machinery

AM03 Maintain and service hydraulic system components

AM04 Maintain and service tires

AM05 Maintain and repair processing and storing equipment

AM06 Maintain and service dusting, spraying, and fertilizing equipment

AM07 Calibrate and service fertilizing equipment

AM08 Maintain and repair tillage and planting machinery

AM09 Maintain and repair crop harvesting equipment

AM10 Tune and maintain tractors

AM11 Maintain and service mechanical systems

AM12 Maintain and service cooling systems

AM13 Maintain and service the ignition system

AM14 Maintain and service brake systems

AM15 Maintain and service cranking motor systems

AM16 Maintain and service charging systems

AM17 Maintain and service clutches

AM18 Maintain and service differentials

AM19 Maintain and service electrical system accessories

SUBCLUSTER: AGRICULTURAL MECHANICS

Sheet 1 of 1

TASK: Assemble and perform basic machinery service

Code: ANR - AMO.

Student Name: _____

Student Progress					Behavioral Task Knowledges/Task Skills
Introduced	Involved	Productive	Employable		
					Given the necessary tools, materials, equipment, and requisite knowledge, the learner will: 1. demonstrate a degree of skill in using basic mechanics handtools. 2. demonstrate a degree of skill in using specialized manufacturer's tools. 3. recognize and demonstrate the need for machine cleanliness and clean work areas. 4. layout pre-assembled parts and components. 5. interpret the manufacturer's manual for assembling and adjustment of machinery. 6. properly lubricate equipment upon and during assembly. 7. properly adjust machinery for efficient operation.

Instructional Methods

- Students work at farm equipment dealership assembling equipment for an exploratory experience.
- Teacher requests from an equipment dealer that a piece of machinery be assembled in school by AGR students (class assembly project).
- Students view films and charts.
- Teacher encourages small peer group cooperation and interaction.
- Teacher concentrates his effort with students having difficulty.

Task-Related Competencies	Instructional Materials		
	Title	Media	Bib.
KNOWLEDGE A 2,3,6,7	"Balanced Head Mower"	8	9
	"Baled Hay"	8	15
NUMBERS B 2	"Big Acre Handling of Hay and Forage Crops"	8	2
APPLICATION C 3,5,6	"The Business of Gleaning"	8	2
	"Golden Touch"	8	9
PHYSICAL D 1a,b,d,2d, 3a,b,c,f,g	"New Formula for Forage Handling"	8	10
	Charts from equipment manufacturers	16	

SUBCLUSTER: AGR CULTURAL MECHANICS

Code: ANR - AM01 TASK: Assemble and perform basic machinery service

Basic Information for Cooperative Teaching		Suggestions:
Language of the Task	Quantitative Concepts	• Stress the importance of following instructions in order. • Consult with the AGR mechanics instructor for details.
Small tools End wrenches Socket wrenches Torque wrenches Box end wrenches Jimmy bars Air wrenches Electric wrenches	Interpret foot-pounds, and inches-pounds of torque. Follow an exact, step-by-step procedure in assembling equipment; as specified by manufacturer.	

Supportive Instructional Materials:

SUBCLUSTER: AGRICULTURAL MECHANICS

Sheet 1 of 1

TASK: Lubricate agricultural equipment and machinery

Code: AMR - AM02

Student Name: _____

Student Progress				Behavioral Task Knowledges/Task Skills
Introduced	Involved	Productive	Employable	

Given the necessary tools, materials, equipment, and requisite knowledge, the learner will:

1. identify and interpret specifications of oil by grade, type, and weight.
2. identify and interpret the specifications and application of different greases and gear oils.
3. identify and interpret the specifications of filters by type and size.
4. perform the following job skills with accuracy to meet the manufacturer's specifications:
   a. operate cup greaser
   b. repack wheel bearings
   c. grease universal joints
   d. grease fittings
   e. change oil filters
   f. maintain breather caps
   g. flush and replace gear oil.

Instructional Methods

- Students lubricate and service the school's tractor regularly.
- Teacher provides a demonstration using teacher-made transparencies and worksheets on lubrication servicing.
- Teacher matches successful students who are interested in helping those having difficulty.
- Para-professionals provide sustained involvement with students having difficulty with this task.

Task-Related Competencies	Instructional Materials		
	Title	Media	Bib.
KNOWLEDGE A 3,8,9 NUMBERS B 2a APPLICATION C 2a,3,5 PHYSICAL D 1a,b,d,f,2b, 3a,b,c,f,g			

SUBCLUSTER: AGRICULTURAL MECHANICS

Code: ANR - AM02 TASK: Lubricate agricultural equipment and machinery

Basic Information for Cooperative Teaching		Suggestions:
Language of the Task	Quantitative Concepts	• Stress importance of being clean as you work. • Use a glass measuring cup and milk bottle; dye the water and let students practice pouring.
Leak - burn Filter Oil Grease Fitting Lubricate Drain Gun Can Container 20 SAE 20w 10 w 40 Gasket	Identify common grease quantities and/or containers: tubes, bulk, by the pound. Recognize capacities of oil containers: pint, quart, 4-quart, 5-quart, 8-quart, 10-quart, 5-gallon, and drums-30 gallon 55 gallon.	

Supportive Instructional Materials:

Can of oil

Oiling can

SUBCLUSTER: AGRICULTURAL MECHANICS

Sheet 1 of 1

TASK: Maintain and service hydraulic system components

Code: ANR - AM03

Student Name: _____

Student Progress				Behavioral Task Knowledges/Task Skills
Introduced	Involved	Productive	Employable	
				Given the necessary tools, materials, equipment, and requisite knowledge, the learner will: 1. identify different types of hydraulic system. 2. identify and describe the function of hydraulic components of a given hydraulic system. 3. recognize and observe specific safety precautions in working with hydraulic fluids and systems. 4. perform the following job skills with accuracy to meet the manufacturer's specifications: a. remove and replace hydraulic hoses b. remove hydraulic lines c. operate a machine with hydraulic equipment d. disassemble and repair hydraulic pump e. disassemble and repair hydraulic cylinders f. disassemble and repair hydraulic motors.

Instructional Methods

- Students are involved in the maintenance and service of hydraulic systems - performing the identified job skills.
- Teacher provides a demonstration of specific job skills using transparencies and hydraulic components.
- Para-professionals provide sustained involvement with students having difficulty with this task.
- Teacher concentrates his effort with students having difficulty.

Task-Related Competencies	Instructional Materials		
	Title	Media	Bib.
KNOWLEDGE A 1,2,3,4,5,6, 7,8,9 NUMBERS B 2a,b,4b,c, f,5 APPLICATION C 3,5,6,8 PHYSICAL D 1a,b,c,d,f, 2b,3c,f,g	Mockup of hydraulic system Teacher-made transparencies	2 12	

SUBCLUSTER: AGRICULTURAL MECHANICS

Code: ANR - AM03 TASK: Maintain and service hydraulic system components

Basic information for Cooperative Teaching		Suggestions:
Language of the Task	Quantitative Concepts	• Be fully aware of precautionary measures of a hydraulic system and safety measures to follow for proper maintenance. • Plan and take a field trip to a farm shop and have a mechanic disassemble a hydraulic cylinder and explain mechanism.
Hydraulic Hydraulic function Safety precautions Hydraulic fluids Hydraulic cylinders Hydraulic pumps Hydraulic motors	Hydrualic pressure is measured in pounds of pressure per square inch (p.s.i.)	

Supportive Instructional Materials:

SUBCLUSTER: AGRICULTURAL MECHANICS

TASK: Maintain and service tires

Code: ANR - AM04

Student Name: _____

Student Progress				Behavioral Task Knowledges/Task Skills	Instructional Methods
Introduced	Involved	Productive	Employable	Given the necessary tools, materials, equipment, and requisite knowledge, the learner will: 1. perform the following job skills with accuracy to meet the accepted manufacturer's specifications: a. mount and dismount tires from rim b. inflate air to manufacturer's specification c. replace valve stem d. patch tire tubes e. load tires with chloride f. load tires with powdered lead.	• Students will be involved in the maintenance and service of agricultural equipment tires-performing the identified job skills. • Para-professional provides basic demonstration on mounting/dismounting tires. • Students repair and/or service tires from school equipment. • Teacher encourages small peer group cooperation and interaction.

Task-Related Competencies	Instructional Materials		
	Title	Media	Bib.
KNOWLEDGE A 1,2,3,4,6,7,8,9 NUMBERS B 2a,b,4b,d,e,5 APPLICATION C 3,5,6,7,8 PHYSICAL D 1a,b,c,d,f,2b,c,3b,c,g			

SUBCLUSTER: AGRICULTURAL MECHANICS

Code: ANR - AM04 TASK: Maintain and service tires

Basic Information for Cooperative Teaching		Suggestions:
Language of the Task	Quantitative Concepts	
Mount tires Dismount tires Inflate Specifications Valve stem Powdered lead Calcium chloride Pump	Read a tire air pressure gauge Calculate amount of chloride from a ratio chart.	• Discuss reading a manual of instructions related to operation of power equipment used in placing a tire on a rim. • Discuss how to read inflation specifications and embossed directive to be found on side wall of tire casing and how to read air pressure gauge.

Supportive Instructional Materials:

Air pressure gauge

SUBCLUSTER: AGRICULTURAL MECHANICS

Sheet 1 of 1

TASK: Maintain and repair processing and storing equipment

Code: ANR - AM05

Student Name: _____

Student Progress				Behavioral Task Knowledges/Task Skills
Introduced	Involved	Productive	Employable	

Given the necessary tools, materials, equipment, and requisite knowledge, the learner will:

1. identify and describe the function of the component parts of an elevator.
2. identify and describe the function of the component parts of silo filling equipment.
3. recognize and observe specific safety precautions related to servicing of storage equipment.
4. clean storage equipment for reuse.
5. treat storage equipment for specified conditions.
6. safely operate storage equipment, demonstrating a degree of skill.

Instructional Methods

- Students visit a farm to observe silo filling and/or corn storage operations.
- Students view films
- Students service processing and storing equipment during a three week work exploratory experience at local dealership.
- Para-professionals provide sustained involvement with students having difficulty with this task.

Task-Related Competencies	Instructional Materials		
	Title	Media	Bib.
KNOWLEDGE A 2,3,9	"The Magic of Harvestor Storage"	8	24
NUMBERS B 2	"Adventures in Agricultural Automated Packing Housing"	8	16
APPLICATION C 3,5,9			
PHYSICAL D 1a,d,2c,3a, b,c,f,g			

SUBCLUSTER: AGRICULTURAL MECHANICS

Code: ANR - AM05 TASK: Maintain and repair processing and storing equipment

Basic Information for Cooperative Teaching		Suggestions:
Language of the Task	Quantitative Concepts	
Blowers Chain links Flight links Lubrication Elevation Gravity boxes Self-unloading Wagons Cross elevators	Recognize the following capacities: bushels, tons, pecks, pounds, hundred weight, pints, and quarts.	• Visit a farm where they are filling a silo or feeding out of a silo with automatic equipment. • Visit a local elevator and see how grain is transferred from one bin to another bin.

Supportive Instructional Materials:

SUBCLUSTER: AGRICULTURAL MECHANICS

TASK: Maintain and service dusting, spraying, and fertilizing equipment

Code: ANR - AM06

Student Name: _____

Student Progress					Behavioral Task Knowledges/Task Skills	Instructional Methods
Introduced	Involved	Productive	Employable		Given the necessary tools, materials, equipment, and requisite knowledge, the learner will: 1. identify and name the component parts of the following dusting and spraying equipment: a. sprayer b. pumps c. nozzles d. booms e. tanks f. agitators. 2. identify and name the component parts of the following fertilizing equipment: a. solid fertilizer distributors b. gaseous fertilizer distributors. 3. demonstrate the basic procedures in assisting to calibrate and adjust equipment. 4. perform the following job skills with manufacturer's specification accuracy: a. regulate spray pressure b. clean spray nozzles c. clean a sprayer d. clean a fertilizer distributor e. prepare a fertilizer unit for storage.	• Students view film on application of pesticides. • Teacher and students calibrate and service dusting and spraying equipment to be used on school farm. • Para-professionals provide sustained involvement with students having difficulty. • Teacher concentrates his effort with students having difficulty.

Task-Related Competencies	Instructional Materials		
	Title	Media	Bib.
KNOWLEDGE A 1,3,6,9 NUMBERS B 2,4f APPLICATION C 3,5,8 PHYSICAL D 1a,b,d,2c, 3a,c,f,g	"Pesticides-Fundamentals of Proper Application"	8	3

SUBCLUSTER: AGRICULTURAL MECHANICS

Code: ANR - AM06 TASK: Maintain and service dusting, spraying, and fertilizing equipment

Basic Information for Cooperative Teaching		Suggestions:
Language of the Task	Quantitative Concepts	
Sprayer Pump Nozzles Screens Mesh Micron Pressure Pt. regulator Hose Tanks - types and sizes Tips Rinse-wash-scrape-scrub Neutralizer-carrier-calibrate Surface tension Droplet size Powder Blower Dew Adhere Air flow Wind (speed and direction) Mist carry over	Recognize and interpret the following: micron (hole size) G.P.A. (gallons/acre) G.P.M. (gallons/minute) R.P.M. (revolutions/minute P.S.I. (pounds/square inch) Mixing ratios	

Supportive Instructional Materials:

SUBCLUSTER: AGRICULTURAL MECHANICS

Sheet 1 of 1

TASK: Calibrate and service fertilizing equipment

Code: ANR - AM07

Student Name: _____

Student Progress				Behavioral Task Knowledges/Task Skills
Introduced	Involved	Productive	Employable	
				Given the necessary tools, materials, equipment, and requisite knowledge, the learner will: 1. calibrate amount of fertilizer per acre on spreader. 2. calibrate amount of fertilizer per acre on drill. 3. calibrate liquid fertilizer spreaders. 4. lubricate fertilizing equipment in accordance with manufactuer's specifications. 5. clean fertilizing equipment for re-use.

Instructional Methods

- Students calibrate, clean, and lubricate fertilizer equipment after its use at buildings trades house or land lab.
- Mechanic from local dealership visits class and provides a demonstration on calibration of fertilizing equipment.
- Teacher encourages small peer group cooperation and interaction.
- Para-professionals provide sustained involvement with students having difficulty with this task.

Task-Related Competencies	Instructional Materials		
	Title	Media	Bib.
KNOWLEDGE A 1,7,9	fertilizer equipment	1	
NUMBERS			
APPLICATION C 5			
PHYSICAL D 1a,d,2b			

SUBCLUSTER: AGRICULTURAL MECHANICS

Code: ANR - AM07 TASK: Calibrate and service fertilizing equipment

Basic Information for Cooperative Teaching		Suggestions:
Language of the Task	Quantitative Concepts	
Bulk fertilizer Bag fertilizer Liquid fertilizer Starter fertilizer Anhydrous application (gas)	Recognize and interpret the meaning of: pounds/acre, tons/acre, and gallons/acre. Ratios of fertilizer mixture: 10-20-10, and 8-32-16.	• Visit farm in planting season and see how fertilize applicators work. • Consult with AGR mechanics teacher. • Discuss safety measures when working with ammonia.

Supportive Instructional Materials:

Resource person to impress students with the importance of the safe handling practices of fertilizer.

SUBCLUSTER: AGRICULTURAL MECHANICS

Sheet 1 of 1

TASK: Maintain and repair tillage and planting machinery

Code: AMR - AM08

Student Name: _____

Student Progress	Behavioral Task Knowledges/Task Skills	Instructional Methods
Introduced / Involved / Productive / Employable	Given the necessary tools, materials, equipment, and requisite knowledge, the learner will: 1. identify and name the component parts of basic tillage implements: a. moldboard plow b. disk harrow c. spring tooth harrow. 2. identify and name the component parts of basic planting implements: a. crop planters b. grain drills c. cyclone seeders d. cultivators. 3. follow prescribed procedures in: a. adjusting plows b. adjusting depth of harrows c. lubricating disk harrows d. adjusting cultivators e. checking equipment calibrations f. hitching equipment g. lubricating equipment.	• Teacher provides a demonstration of the use of the machines on the school's land lab or at a student's farm. • Students participate in performing the identified job skills on machinery and equipment in the farm shop. • Students visit a dealer's open house to view the specialized machinery. • Para-professionals provide sustained involvement with students having difficulty with this task.

Task-Related Competencies	Instructional Materials		
	Title	Media	Bib.
KNOWLEDGE A 2,3,9 NUMBERS B 4a APPLICATION C 2,5,8 PHYSICAL D 1a,d,2e,3a, e,f,g			

SUBCLUSTER: [illegible]

Code: [illegible] TASK [illegible]

Basic Information for Cooperative Teaching		Suggestions
Language of the Task	Quantitative Concepts	
[illegible] equipment [illegible] equipment [illegible]-mounted equipment Self-propelled equipment	Acres [illegible] [illegible] Gallons [illegible]	* [illegible] * [illegible] and preventive maintenance.

Supportive Instructional Materials:

SUBCLUSTER: AGRICULTURAL MECHANICS

Sheet 1 of 1

TASK: Maintain and repair crop harvesting equipment

Code: AMR - AM09

Student Name: _____

Student Progress				Behavioral Task Knowledges/Task Skills
Introduced	Involved	Productive	Employable	

Given the necessary tools, materials, equipment, and requisite knowledge, the learner will:

1. recognize and observe specific safety precautions related to servicing crop harvesting equipment.
2. identify and name the component parts of a pitmanless mower.
3. identify and name the component parts of hay rakes and balers.
4. identify and name the component parts of corn pickers and harvesters.
5. perform the following job skills with accuracy to meet the manufacturer's specifications:
   a. clean and lubricates balers, mowers, and rakes
   b. adjust axles and hitches
   c. lubricates gathering chains, bushing rolls, bearings, and bushings
   d. adjust chain and belt tension
   e. replace mower knives, ledger plates, and guards
   f. grind mower knives
   g. adjust height of cut
   h. handling between-season care
   i. maintain and service cutter bars and rasp bars.

Instructional Methods

- Students arrange visit to implement dealership to observe servicing of harvesting equipment.
- Farm students bring in specific machines for service and lubrication.
- Students view film
- Teacher encourages small peer group cooperation and interaction.

Task-Related Competencies	Instructional Materials		
	Title	Media	Bib.
KNOWLEDGE A 3,5,6,9	Harvesting machinery/equipment	1	
NUMBERS B 2,4a,c	"Apples Away"	3	13
APPLICATION C 2,3,5			
PHYSICAL D 1a,d,2c,3a,c,f,g			

SUBCLUSTER: AGRICULTURAL MECHANICS

Code: ANR - A109 TASK: Maintain and repair crop harvesting equipment

Basic Information for Cooperative Teaching		Suggestions:
Language of the Task	Quantitative Concepts	• Visit a farm during harvest season and see the actual equipment at work.
Belts Chains Roller Hook link Sprockets Pulleys Gears Gathering chain Husking rolls Bearings Bushings	Recognize and identify: Bushels Tons Acres/hour Lbs./bushel R.P.M.	

Supportive Instructional Materials:

SUBCLUSTER: AGRICULTURAL MECHANICS

Sheet 1 of 1

TASK: Tune and maintain tractors

Code: AHR - AH10

Student Name: _____

Student Progress				Behavioral Task Knowledges/Task Skills	Instructional Methods
Introduced	Involved	Productive	Employable	Given the necessary tools, materials, equipment, and requisite knowledge, the learner will: 1. identify and describe the function and operation of the major tractor systems. 2. perform the following job skills with accuracy to meet the manufacturer's specifications: a. replace plugs b. clean service oil bath and air cleaners c. service the fuel line, sediment bowl, and filter d. check radiator hoses and hose clamps e. check fan belt for wear and tension f. flush cooling system g. refill cooling system h. change antifreeze i. check and adjust brakes j. check tire pressure.	• Student work in teams-performing the identified job skills on the school tractor. • Teacher makes contact with each student during the class period. • Teacher encourages small peer group cooperation and interaction.

Task-Related Competencies	Instructional Materials		
	Title	Media	Bib.
KNOWLEDGE A 1,2,3,4,6,7 NUMBERS B 2,4a,f,5, APPLICATION C 2,3,5,8 PHYSICAL D 1a,d,2c,3a, b,c,f,g			

SUBCLUSTER: AGRICULTURAL MECHANICS

Code: ANR - AM1C TASK: Tuen and maintain tractors

Basic Information for Cooperative Teaching			Suggestions:
Language of the Task		Quantitative Concepts	• Consult with AGR mechanics instructor for more details.
Plugs	Calcium chloride	Measure belt tension	
Wires	Time light	Recognize liquid quantities: quarts and gallons.	
Points	Pressure (p.s.i.)	Recognize ratios: 1:1 2:1 40% 50% 60%	
Condenser			
Manual			
Instructions			
Air cleaner (Types)		Identify 20 thousandths of an inch (.020).	
Check			
Ratio			
Feeler gauge			
Gap (clearance)			
Freezing			
Over heating			
Anti-freeze			

Supportive Instructional Materials:

Screw drivers
Chalk

SUBCLUSTER: AGRICULTURAL MECHANICS

Sheet 1 of 1

TASK: Maintain and service mechanical systems

Code: ANR - AM11

Student Name: _____

Student Progress				Behavioral Task Knowledges/Task Skills
Introduced	Involved	Productive	Employable	

Given the necessary tools, materials, equipment, and requisite knowledge, the learner will:

1. identify the type or model of specific engines.
2. explain the basic operation of the two and four cycle engine.
3. identify , describe, and explain the basic function of each engine component.
4. recognize and observe specific safety precautions relating to the maintenance and service of the mechanical system.
5. perform the following job skills with accuracy to meet the accepted manufacturer specifications:
   a. remove and replace engine
   b. clean ring grooves
   c. torque main bearing caps
   d. compress piston rings and install piston
   e. replace motor mounts, engine in vehicle
   f. check surface condition.

Instructional Methods

- Teacher provides demonstration of job skills on different types of engines.
- Students become acquainted with parts by handling part models.
- Students view engine operation sequences on teacher-made cut-away of a small gas engine.
- Students will be involved in disassembly and assembly of engines performing the identified job skills.
- Teacher concentrates his effort with students having difficulty.

Task-Related Competencies	Instructional Materials		
	Title	Media	Bib.
KNOWLEDGE A 3,7,8,9	"Engine Breakdown"	5	19
NUMBERS B 1,4a,b,c,5	"Engine Components"	5	1
APPLICATION C 2,3,4,5,6,7,8,9	Teacher-made transparencies, 3M transparencies DCA transparencies	12	22,6
PHYSICAL D 1a,c,d,f,2b,3a,c	Engine mockup	1	

SUBCLUSTER: AGRICULTURAL MECHANICS

Code: ANR - AM11 TASK: Maintain and service mechanical systems

Basic Information for Cooperative Teaching		Suggestions:
Language of the Task	Quantitative Concepts	
Pistons Valves Rods Insert bearings Crankshaft Stroke Cycle Firing interval Torque Clearance	Distinguish between parts that [illegible] specifications and faulty [illegible].	

Supportive Instructional Materials:

SUBCLUSTER: AGRICULTURAL MECHANICS

Sheet 1 of 1

TASK: Maintain and service cooling systems

Code: ANR - AM12

Student Name: _____

Student Progress				Behavioral Task Knowledges/Task Skills	Instructional Methods
Introduced	Involved	Productive	Employable	Given the necessary tools, materials, equipment, and requisite knowledge, the learner will: 1. identify and describe the basic operation of a water-cooled engine. 2. recognize and observe specific safety precautions relating to maintenance and service of the cooling system. 3. perform the following job skills with accuracy to meet the accepted manufacturer's specifications: a. check and replace heater and radiator hoses b. remove, test, and replace thermostat c. flush radiator and system d. adjust fan belt tension e. drain and flush cooling system.	• Teacher and/or para-professional provide a demonstration of procedures for servicing that cooling system. • Students will be involved in the maintenance and service of equipment cooling systems-performing the identified job skills. • Students view sound/slide program and transparencies on the cooling system. • Para-professionals provide sustained involvement with students having difficulty with this task.

Task-Related Competencies	Instructional Materials		
	Title	Media	Bib.
KNOWLEDGE A 3,7,8,9	"Radiator Construction"	12	22
NUMBERS B 2b,4f	"Water Pump Construction"	12	22
APPLICATION C 3,5,6,7,8,9	"Lubrication and Cooling Systems"	5	22
PHYSICAL D 1a,b,c,d,2b, 3b,c,g			

SUBCLUSTER: AGRICULTURAL MECHANICS

Code: ANR - AM12 TASK: Maintain and service cooling systems

Basic Information for Cooperative Teaching		Suggestions:
Language of the Task	Quantitative Concepts	
Radiator Water cooled Belt tension Thermostat Pressure meter pump	Read and interpret radiator and anti-freeze capacities as to "degree" of climate region. Identify capacity of radiator	

Supportive Instructional Materials:

SUBCLUSTER: AGRICULTURAL MECHANICS

TASK: Maintain and service the ignition system

Code: ANR - AM13

Student Name: _____

Student Progress				Behavioral Task Knowledges/Task Skills
Introduced	Involved	Productive	Employable	
				Given the necessary tools, materials, equipment, and requisite knowledge, the learner will: 1. identify and verbally describe the operation and function of each ignition system component. 2. recognize and observe specific safety precautions related to the servicing of the ignition system. 3. perform the following job skills with accuracy to meet the accepted manufacturer's specifications: a. remove and replace ignition wires b. check, clean, gap, or replace spark plugs c. service or repair points and condensor d. time ignition 1) dead timing 2) timing light e. set points 1) feeler gauge 2) dwell meter.

Instructional Methods

- Teacher provides demonstration on use of testing equipment and service techniques.
- Students will be involved in maintaining and servicing the components of the ignition system-performing the identified job skills.
- Students view slide/sound program on ignition system.
- Teacher encourages small peer group cooperation and interaction.

Task-Related Competencies	Instructional Materials		
	Title	Media	Bib.
KNOWLEDGE A 2,3,7,8,9	"Ignition Systems"	4	12
NUMBERS B 2a,b,4c,d, f,h,5,6	"Ignition"	12	22
APPLICATION C 3,5,6,8	Mockups	2	
PHYSICAL D 1a,b,c,d,f, 2b,3c			

SUBCLUSTER: AGRICULTURAL MECHANICS

Code: ANR - AM13 TASK: Maintain and service the ignition system

Basic Information for Cooperative Teaching		Suggestions:
Language of the Task	Quantitative Concepts	
Feeler gauge Dwell meters Vacuum gauge Syncrograph Condenser Timing light	Interpret vacuum as measured in inches of mercury. Recognize and interpret degrees of angularity as used in measurement of timing and dwell.	

Supportive Instructional Materials:

SUBCLUSTER: AGRICULTURAL MECHANICS

Sheet 1 of 1

TASK: Maintain and service brake systems

Code: AMR - A114

Student Name: _____

Student Progress				Behavioral Task Knowledges/Task Skills
Introduced	Involved	Productive	Employable	

Given the necessary tools, materials, equipment, and requisite knowledge, the learner will:

a. identify the different types of brake system.

2. describe the operation or function of specific components of brake system.

3. recognize and observe specific safety precautions in servicing brakes.

4. perform the following job skills with accuracy to meet the accepted manufacturer's specifications:
   a. check and adjust brakes
   b. clean and repack front wheel bearings and check seals
   c. replace brake discs
   d. replace brake shoes
   e. bleed air from brake systems.

Instructional Methods

- Para-professionals provide sustained involvement with students having difficulty with this task.
- Teacher provides a demonstration of the individual job skills using mockups, transparencies, and charts.
- Students will be involved in the maintenance and service of brake systems-performing the identified job skills.
- Teacher concentrates his effort with students having difficulty.

Task-Related Competencies	Instructional Materials		
	Title	Media	Bib.
KNOWLEDGE A 2,3,7,8,9 UNDERSTANDINGS B 2a,b,4c,f,5 APPLICATION C 3,5,6,8 PHYSICAL D 1a,b,c,d,f,2b,3c,f,8	Mockups of different brake cut-aways	2	

SUBCLUSTER: AGRICULTURLA MECHANICS

Code: ANR - AM14 TASK: Maintain and service brake systems

Basic Information for Cooperative Teaching		Suggestions:
Language of the Task	Quantitative Concepts	
Disc brakes Brake drums Brake shoes internal external Hydraulic brakes Fluid pressure Bleeding brakes Brake fluid Pounds per square inch (p.s.i.) Gallons per minute (G.P.M.)	Recognize different containers as to volume, i.e. pint, quart, and gallon. Read gauges (p.s.i.)	

Supportive Instructional Materials:

SUBCLUSTER: AGRICULTURAL MECHANICS

TASK: Maintain and service cranking motor systems

Code: ANR - AM15

Student Name: _____

Student Progress					Behavioral Task Knowledges/Task Skills	Instructional Methods
Introduced	Involved	Productive	Employable		Given the necessary tools, materials, equipment, and requisite knowledge, the learner will: 1. identify and describe with a drawing the starting system. 2. recognize and observe specific safety precautions related to the maintenance and service of starters. 3. perform the following job skills with accuracy to meet the accepted manufacturer's specifications: a. check starter draw with BST b. check for starter voltage drop c. remove and replace starter from vehicle d. disassemble starter e. replace starter brushes f. check starter on load tests g. perform grouter tests h. perform continuity tests i. replace bushings j. check starter drive.	• Teacher concentrates his effort with students having difficulty. • Students will be involved in repairing and servicing tractor starters - performing the identified job skills. • Teacher provides a demonstration of procedures/techniques with transparencies, mockups, and charts. • Teacher matches successful students who are interested in helping those having difficulty.

Task-Related Competencies	Instructional Materials		
	Title	Media	Bib.
KNOWLEDGE A 2,3,7,8,9	Mockups-Disassembled starter	2	
NUMBERS B 2a,b,4c,d,f,h,5,6	Delco-Remy charts	16	7
APPLICATION C 3,5,6,8			
PHYSICAL D 1a,b,c,d,f,2b,3c			

SUBCLUSTER: AGRICULTURAL MECHANICS

Code: ANR - AM15 TASK: Maintain and service cranking motor systems

Basic Information for Cooperative Teaching		Suggestions:
Language of the Task	Quantitative Concepts	• Ask AGR mechanics teacher for drawings of meter faces. Trace in meter needle and practice taking meter readings.
Voltage Amperage Resistance (Ohmmeter) Continuity test	Read and interpret: ammeter, voltmeter and ohmmeter.	

Supportive Instructional Materials:

Meter faces

SUBCLUSTER: AGRICULTURAL MECHANICS

TASK: Maintain and service the charging system

Code: ANR - AM16

Student Name: _____

Student Progress				Behavioral Task Knowledges/Task Skills	Instructional Methods
Introduced	Involved	Productive	Employable	Given the necessary tools, materials, equipment, and requisite knowledge, the learner will: 1. identify and describe the basic principles and operation of the charging system. 2. list and name the parts of the charging system. 3. recognize and observe specific safety precautions related to servicing starter systems. 4. perform the following job skills with accuracy to meet the accepted manufacturer's specifications: a. adjust belt tension b. visually inspect generator, regulator, and connnecting wires.	• Teacher encourages small peer group cooperation and interaction. • Students will be involved in the service the charging components of the tractor by performing the identified job skills. • Teacher leads a small group demonstration of the job skills using charts, transparencies, and mockups. • Para-professionals provide sustainted involvement with students having difficulty with this task.

Task-Related Competencies	Instructional Materials		
	Title	Media	Bib.
KNOWLEDGE A 2,6,7,8,9 NUMBERS B 2a,b,4c,d,f, h,5,6 APPLICATION C 3,5,6,8 PHYSICAL D 1a,b,c,d,f, 2b,3c	Mockups of: generator alternator regulator	2	
	Delco Remy Charts	16	7
	"Changing System"	12	1

SUBCLUSTER: AGRICULTURAL MECHANICS

Code: AMR - AM16 TASK: Maintain and service the charging system

Basic Information for Cooperative Teaching		Suggestions:
Language of the Task	Quantitative Concepts	
Voltage Amperage Resistance Electro magnetic Switches Magnetism Diodes	Read and interpret amperages and voltages from a meter.	

Supportive Instructional Materials:

SUBCLUSTER: AGRICULTURAL MECHANICS

Sheet 1 of 1

TASK: Maintain and service clutches

Code: ANR - AM17

Student Name: _____

Student Progress					Behavioral Task Knowledges/Task Skills
Introduced	Involved	Productive	Employable		
					Given the necessary tools, materials, equipment, and requisite knowledge, the learner will: 1. identify and describe the function of the component parts of a clutch. 2. recognize and observe specific safety precautions in servicing clutches. 3. perform the following job skills with accuracy to meet the accepted manufacturer's specifications: a. adjust clutch freeplay b. remove and replace clutch platè c. adjust finger play d. check clutch for run out e. check pilot bearing f. check throw out bearing g. remove and replace pilot bearing h. remove and replace throw out bearing.

Instructional Methods

- Students will be involved in the maintenance and service of clutches - performing the identified job skills.
- Teacher directs a demonstration of job skills using mock-ups, transparencies and charts.
- Para-professionals provide sustained involvement with students having difficulty with this task.
- Teacher matches successful students who are interested in helping those having difficulty.

Task-Related Competencies	Instructional Materials		
	Title	Media	Bib.
KNOWLEDGE A 2,7,8,9	Mockup of clutch, pressure-plate, throw out bearing	2	
NUMBERS B 2a,b,4b,c,d, f,g,5	"Clutches"	12	6
APPLICATION C 3,5,6,7,8			
PHYSICAL D 1a,b,c,d,e, f,2b,c,d,3a, c,e,f,g			

SUBCLUSTER: AGRICULTURAL MECHANICS

Code: ASR - AM17 TASK: Maintain and service clutches

Basic Information for Cooperative Teaching		Suggestions:
Language of the Task	Quantitative Concepts	
Flywheel Clutch plate Pressure plate Clutch fingers Throw out bearing Pilot bearing	Measure pounds per square inch for clutch springs using scale accuracy to within 1/64 of an inch.	

Supportive Instructional Materials:

SUBCLUSTER: AGRICULTURAL MECHANICS

Sheet 1 of 1

TASK: Maintain and service differentials

Code: ANR - AM18

Student Name: _____

Student Progress				Behavioral Task Knowledges/Task Skills
Introduced	Involved	Productive	Employable	

Given the necessary tools, materials, equipment, and requisite knowledge, the learner will:

1. identify and describe the function of the component parts of a differential.
2. recognize and observe safety precautions in servicing differentials.
3. perform the following job skills with accuracy to meet the accepted manufacturer's specifications:
   a. change differential fluid
   b. check differential fluid level
   c. set back lash
   d. check for improper operation
   e. check for chips or cracks
   f. check bearings
   g. remove and replace faulty gears.

Instructional Methods

- Teacher encourages small peer group cooperation and interaction.
- Para-professional provide sustained involvement with students having difficulty with this task.
- Students will be involved in the maintenance and service of differential - performing the identified job skills.
- Teacher leads a small group demonstration of job skills using mockups, transparencies, and charts.

Task-Related Competencies	Instructional Materials		
	Title	Media	Bib.
KNOWLEDGE A 2,3,7,8,9	"Differential"	12	6
NUMBERS B 2a,b,4c,g,5	Mockup of differential on an stand	2	
APPLICATION C 3,5,6,7,8			
PHYSICAL D 1a,b,c,d,f, 3a,c,e,f,g			

SUBCLUSTER: AGRICULTURAL MECHANICS

Code: ANR - AM18 TASK: Maintain and service differentials

Basic Information for Cooperative Teaching		Suggestions:
Language of the Task	Quantitative Concepts	
Ring gear Pinion gear Spider gear Bull gear Bull pinion Differential Carrier	Measure clearances using a dial indicator of feeler gauge with .001" accuracy.	

Supportive Instructional Materials:

SUBCLUSTER: AGRICULTURAL MECHANICS

Sheet 1 of 1

TASK: Maintain and service electrical system accessories

Code: ANR - AM19

Student Name: _____

Student Progress	Behavioral Task Knowledges/Task Skills	Instructional Methods
Introduced / Involved / Productive / Employable	Given the necessary tools, materials, equipment, and requisite knowledge, the learner will: 1. identify and describe the basic operations of the electrical system accessories. 2. recognize and observe specific safety precautions relating to maintenance and service of the electrical system. 3. perform the following job skills with accuracy to meet the accepted manufacturer's specification: a. remove and replace electrical accessories such as: directional signals, headlights, and flashes.	• Teacher leads a demonstration of the job skills. • Students service the electrical system accessories on the school tractor. • Para-professionals provide sustained involvement with students having difficulty with this task.

Task-Related Competencies	Instructional Materials		
	Title	Media	Bib.
KNOWLEDGE A 2,3,7,8,9 NUMBERS B 2a,b,4a,f, h,5,6 APPLICATION C 3,5,6,8 PHYSICAL D 1a,b,c,d,f, 2b,3c,d,f	Charts: Electricity	16	7

SUBCLUSTER: AGRICULTURAL MECHANICS

Code: ANR - AM19 TASK: Maintain and service electrical system accessories

Basic Information for Cooperative Teaching		Suggestions:
Language of the Task	Quantitative Concepts	• Obtain samples of lamp bulbs and fuses from AGR mechanics teacher to different types and sizes.
Single contact Bulbs Double contact 6 volts 12 volts Amperage Fuses Circuit breakers Sealed beam	Interpret amperes/hour readings Interpret Ohm's law: E=IxR	

Supportive Instructional Materials:

LANDSCAPING AND NURSERY

INSTRUCTIONAL TASK MODULES

LN01 Recognize plants by appearance, growth habits, and plant keys

LN02 Plan and establish a new lawn

LN03 Prepare soil mixtures

LN04 Prepare and apply soil mulches

LN05 Maintain and renovate lawns

LN06 Select plants for the landscape design

LN07 Plant plants in the landscape design

LN08 Maintain plants

SUBCLUSTER: LANDSCAPING AND NURSERY

TASK: Recognize plants by appearance, growth habits, and plant keys

Code: ANR - LN01

Student Name: _____

Student Progress				Behavioral Task Knowledges/Task Skills	Instructional Methods
Introduced	Involved	Productive	Employable	Given the necessary tools, materials, equipment, and requisite knowledge, the learner will: 1. recognize and identify meanings for plant-related terminology: a. leaf terms b. stem terms c. flower terms d. root terms e. general plant terms. 2. use and interpret plant key for identifying plants. 3. identify plants by their unique structures. 4. describe in general terms the growth habits of different types of plants.	• Students identify and discuss plant structure at a greenhouse, on a field trip, or by bringing plants into classroom. • Teacher encourages small peer group cooperation and interaction. • Teacher matches successful students who are interested in helping those having difficutly.

Task-Related Competencies	Instructional Materials		
	Title	Media	Bib.
KNOWLEDGE A 6,9 NUMBERS APPLICATION C 8 PHYSICAL			

SUBCLUSTER: LANDSCAPING AND NURSERY

Code: ANR - LN01 TASK: Recognize plants by appearance, growth habits, and plant keys

Basic Information for Cooperative Teaching		Suggestions:
Language of the Task	Quantitative Concepts	• The needs for support will vary with the Agriculture-related products of each area.
Leaves compound blade petiole Root tap fibrous Stem support transportation Flower Fruit Reproduction	Measure to fractional parts of an inch, 1/8th, 1/16th, 1/32nd. Check with Vocational Agriculture Instructor to determine the need for plant measurement and the methods used.	

Supportive Instructional Materials:

Check with Vocational Agriculture instructor for basic plant keys the student must know.

SUBCLUSTER: LANDSCAPING AND NURSERY

Sheet 1 of 1

TASK: Plan and establish a new lawn

Code: ANR - LN02

Student Name: _____

Student Progress				Behavioral Task Knowledges/Task Skills
Introduced	Involved	Productive	Employable	

Given the necessary tools, materials, equipment, and requisite knowledge, the learner will:

1. operate specialized equipment needed in preparing a lawn.
2. recognize basic quidelines to be followed in planning a new lawn.
3. name the procedures to be followed in establishing a new lawn.
4. demonstrate the proper techniques for treating new stands with mulching, watering, and drainage.
5. take and interpret lawn soil samples.
6. apply fertilizer and seed with spreader, demonstrating a degree of skill.
7. demonstrate appropriate procedures for laying sod for a new lawn.

Instructional Methods

- Students view filmstrip and review workbook exercises.
- Student take soil samples, apply fertilizer, prepare seedbed, and lay sod at the building trades house, and care for the lawn.
- Students work with the school's groundskeeper to seed or replace sections of the school's lawn.

Task-Related Competencies	Instructional Materials		
	Title	Media	Bib.
KNOWLEDGE A 7,9 NUMBERS B 2b,4a APPLICATION C 4,8 PHYSICAL D 1d, 2d, 3f	Turf Maintenance and Establishment	10	17

SUBCLUSTER: LANDSCAPING AND NURSERY

Code: ANR - LN02 TASK: Plan and establish a new lawn

Basic Information for Cooperative Teaching			Suggestions:
Language of the Task		Quantitative Concepts	• Grow different kinds of grass seed in small containers.
Seed	Hoe	Four pounds per square foot	
Sod	Rhizome	Square yards	
Turf	Nitrogen	Sod cost=$.40/square yard	
Top soil	PH	Square foot/pound of seed	
Tilling		Square foot/pound of fertilizer	
Grading			
Drainage			
Mulching			
Fertilizing			
Watering			
Rolling			
Sprinkler			
Hose			
Rake			

Supportive Instructional Materials:

SUBCLUSTER: LANDSCAPING AND NURSERY

Sheet 1 of 1

TASK: Prepare soil mixtures

Code: ANR - LN03

Student Name: _____

Student Progress				Behavioral Task Knowledges/Task Skills	Instructional Methods
Introduced	Involved	Productive	Employable	Given the necessary tools, materials, equipment, and requisite knowledge, the learner will: 1. identify characteristics of poor tilth and good tilth. 2. identify and describe specific organic matter materials. 3. list and demonstrate the procedures for adding organic materials to soils. 4. demonstrate a degree of skill in operating soil preparation equipment: a. rototiller b. shredder 5. prepare soil mixtures with proper tilth by following prescribed procedures.	• Teacher organizes a field trip to local greenhouse to observe soil preparation techniques/procedures. • Students prepare soils in flats, seedbeds, school flower beds, and home gardens. • Teacher provides demonstration of equipment operation and soil preparation procedures. • Students review selected exercises from workbook. • Students view film.

Task-Related Competencies	Instructional Materials		
	Title	Media	Bib.
KNOWLEDGE A 9	Rototiller	1	
NUMBERS	Shredder	1	
APPLICATION C 5	"Fifty Lab Exercises for Vocational Ornamental Horticulture Students"	14	11
	"The Living Soil"	8	20
PHYSICAL D 1d,1,2e,3c, d,e,f	"Lawn and Ground Covers"	10	18

SUBCLUSTER: LANDSCAPING AND NURSERY

Code: ANR - LN03 TASK: Prepare soil mixtures

Basic Information for Cooperative Teaching	
Language of the Task	Quantitative Concepts
Tilth Organic matter Masonary soil Perlite Vermiculite	Recognize bushels as a measurement of volume. Be able to identify a 100#, 50#, 25#, sack by reading weights on the sack or container.

Suggestions:

- Consult with Vocational Agriculture teacher on specific mixtures.
- Arrange a field trip to a farm cooperation storage plant to see organic material and the origin of the materials.
- Discuss the types and amount of organic materials to be added to specific soils.

Supportive Instructional Materials:

SUBCLUSTER: LANDSCAPING AND NURSERY

Sheet 1 of 1

TASK: Prepare and apply soil mulches

Code: ANR - LN04

Student Name: _____

Student Progress	Behavioral Task Knowledges/Task Skills
Introduced / Involved / Productive / Employable	Given the necessary tools, materials, equipment, and requisite knowledge, the learner will: 1. identify and describe the landscaping applications of mulch. 2. prepare and apply mulch mixtures following prescribed procedures.

Instructional Methods

- Students prepare and apply mulches around landscaping of building trades house and school.
- Para-professionals provide sustained involvement with students having difficulty with this task.
- Teacher encourages small peer group cooperation and interaction.
- Teacher concentrates his effort with students having difficulty.

Task-Related Competencies	Instructional Materials		
	Title	Media	Bib.
KNOWLEDGE NUMBERS B 2b,4b,c,5 APPLICATION C 4,5 PHYSICAL D 1d,2c,3c,g	Muich materials and mixing tools	1	

SUBCLUSTER: LANDSCAPING AND NURSERY

Code: ANR - LN04 TASK: Prepare and apply soil mulches

Basic Information for Cooperative Teaching	
Language of the Task	Quantitative Concepts
Peat moss Saw dust Wood chips Peanut hulls Bark Stone Plastic Corn cobs Chlordane	Recognize and interpret: cubic feet cubic yards pounds bags

Suggestions:

- Take a walking field trip planned to see a variety of uses of mulches.

Supportive Instructional Materials:

SUBCLUSTER: LANDSCAPING AND NURSERY

Sheet 1 of 1

TASK: Maintain and renovate lawns

Code: ANR - LN05

Student Name: _____

Student Progress				Behavioral Task Knowledges/Task Skills
Introduced	Involved	Productive	Employable	
				Given the necessary tools, materials, equipment, and requisite knowledge, the learner will: 1. demonstrate the operating and maintenance procedures of several pieces of equipment: a. hand or power aerifiers b. mowing machines c. turf sprinklers d. fertilizer spreader e. seeder f. insecticide/herbicide applicators. 2. plan and carry out a lawn maintenance plan, determining: a. mowing frequency b. mowing height c. watering schedule d. fertilizer types e. frequency of fertilizer application f. frequency of weed control g. needed lawn renovations.

Instructional Methods

- Students perform the identified tasks in maintaining lawns of the schools landscape or building trades house.
- Students view filmstrip and review illustrated workbook manual.
- Teacher concentrates his effort with students having difficulty.
- Para-professionals provide sustained involvement with students having difficulty with this task.

Task-Related Competencies	Instructional Materials		
	Title	Media	Bib.
KNOWLEDGE A 2,7,9	"Lawns and Ground Covers"	10	18
NUMBERS B 4b,c,2,5	Turf grass Maintenance and Establishment	14	17
APPLICATION C 4,5,6,8			
PHYSICAL D 1d,e,2d,3c,e,f,g			

SUBCLUSTER: LANDSCAPING AND NURSERY

Code: ANR - LN05 TASK: Maintain and renovate lawns

Basic Information for Cooperative Teaching		Suggestions:
Language of the Task	Quantitative Concepts	
Granule Fertilizer Fertilizer spreader Sprinkler Soil Mow Frequent Grading Seeding Sodding Transplant	Coverage per sq. ft. 2 cycle motors 1/2 pt. of oil/1 gallon of gas Mowing height: 2-3 inches depending upon temperature	

Supportive Instructional Materials:

SUBCLUSTER: LANDSCAPING AND NURSERY

Sheet 1 of 1

TASK: Select plants for the landscape design

Code: ANR - LN06

Student Name: _____

Student Progress				Behavioral Task Knowledges/Task Skills	Instructional Methods
Introduced	Involved	Productive	Employable	Given the necessary tools, materials, equipment, and requisite knowledge, the learner will: 1. identify basic types of trees and shrubs. 2. identify the basic types of varieties of flowering annuals, biennials, perennials, bulbs, corms, roses, and grasses. 3. recognize the following selection factors for each flower, shrub, tree, and grasses: a. height b. leaf color c. berries or fruit d. bloom sequence e. leaf shape.	• Landscape architect visits class and discusses the selection of plants for the landscape design of residential home and commercial buildings. • Students review slides on selection of trees, shrubs, groundcovers, etc. • Students working in small groups discuss the selection of plantings for a residential plot plan.

Task-Related Competencies	Instructional Materials		
	Title	Media	Bib.
KNOWLEDGE A 6,9 NUMBERS APPLICATION C 3,4,8 PHYSICAL D 1a,c,2a	"Commonly Used Trees, Shrubs, Groundcovers and Vines"	11	17

SUBCLUSTER: LANDSCAPING AND NURSERY

Code: ANR - LN06 TASK: Select plants for the landscape design

Basic Information for Cooperative Teaching		Suggestions:
Language of the Task	Quantitative Concepts	
Annuals Biennials Perennials Landscape design Shrubs Plantings Ornamental flowering plants	Recognize and interpret: inches feet. Recognize length and sequence of seasons.	• Organize and conduct a field trip to a golf course, park, or private home that has been landscaped. Discuss the points to consider when planting as evidenced by the visible examples.

Supportive Instructional Materials:

SUBCLUSTER: LANDSCAPING AND NURSERY

Sheet 1 of 1

TASK: Plant plants in the landscape design

Code: ANR - LN07

Student Name: _____

Student Progress	Behavioral Task Knowledges/Task Skills	Instructional Methods
Introduced / Involved / Productive / Employable	Given the necessary tools, materials, equipment, and requisite knowledge, the learner will: 1. demonstrate the procedures for handling plants upon arrival for temporary storage, long storage periods, and reviving weakened plants. 2. select and properly use specific tools in planting plants. 3. demonstrate a degree of skill in spacing plants, pruning, and planting in groups. 4. set and plant bulbs and corms. 5. set and plant balled/burlap evergreen. 6. set and plant hedges. 7. set and plant rose bushes. 8. set and plant bareroot stock. 9. set and plant small trees.	• Students [illegible] plant plans according to the landscaping plan at the building trades house. • Para-professionals provide sustained involvement with students having difficulty with this task. • Teacher encourages small peer group cooperation and interaction. • Students review illustrated workbook exercises.

Task-Related Competencies	Instructional Materials		
	Title	Media	Bib.
KNOWLEDGE A 9	Landscaping Maintenance and Establishment	14	17
NUMBERS B 4a	Landscape Design	14	17
APPLICATION C 5			
PHYSICAL D 1,2c,3			

SUBCLUSTER: LANDSCAPING AND NURSERY

Code: ANR - LM07 TASK: Plant plants in the landscape design

Basic Information for Cooperative Teaching			Suggestions:
Language of the Task		Quantitative Concepts	• It is important that there be close communications between the vocational teacher and the cooperating teacher, because the supportive need will be closely related to the local environment.
Balled/burlap (B and B)		Ability to read measured distances from landscape design and/or take useful measured distance directions and place planting in designated spot.	
Bulbs	Spreading		
Croms	Transplant (T)		
Hedges	Transplant twice (TT)		
Bushes			
Root stock			
Trees			
Spacing			
Height			
Color combination			
Bare root			
Evergreen			
Deciduous			
Upright			

Supportive Instructional Materials:

SUBCLUSTER: LANDSCAPING AND NURSERY

TASK: Maintain plants

Code: ANR - LN08

Student Name: _____

Student Progress				Behavioral Task Knowledges/Task Skills	Instructional Methods
Introduced	Involved	Productive	Employable	Given the necessary tools, materials, equipment, and requisite knowledge, the learner will: 1. identify and properly use selected tools and materials in maintaining plants. 2. recognize adverse plant conditions. 3. suggest procedures, techniques, or materials for treating adverse plant conditions. 4. demonstrate basic procedures and techniques for watering, dusting, cultivating, pruning, and spraying plants.	• Landscape gardener visits class and discusses selected aspects of landscape maintenance. • Students become involved in the landscape maintenance of the building trades home and/or school buildings. • Teacher matches successful students who are interested in helping those having difficulty. • Teacher concentrates his effort with students having difficulty.

Task-Related Competencies	Instructional Materials		
	Title	Media	Bib.
KNOWLEDGE A 9 NUMBERS B 4,b,c APPLICATION C 4,5,8 PHYSICAL D 1,2e,3	Landscape Maintenance and Establishment	14	17

SUBCLUSTER: LANDSCAPING AND NURSERY

Code: ANR - LN08 TASK: Maintain plants

Basic Information for Cooperative Teaching			Suggestions:
Language of the Task		Quantitative Concepts	
Watering	Stretching	Measure time in minutes, hours, weeks, and seasons.	• Check with the vocational nursery instructor to determine the units of measur ment needed for the specific area of servicing.
Dusting	Yellowing	Measure distances in inches and feet.	
Cultivating		Measure quantity in teaspoon thru gallons.	
Spraying			
Pruning			
Hose			
Hoe			
Shovel			
Rake			
Shears			
Fertilizer			
Mulch			
Wheelbarrow			
Riding mower			

Supportive Instructional Materials:

GREENHOUSE / FLORICULTURE

INSTRUCTIONAL TASK MODULES

GF01 Identify common cut flowers

GF02 Identify common flowering pot plants

GF03 Identify common foliage plants and florist greens

GF04 Apply the principles of design to flower arranging

GF05 Select floral holding devices, containers, and supplies

GF06 Prepare home and hospital arrangements

GF07 Prepare wedding floral arrangements

GF08 Prepare funeral floral arrangements

GF09 Decorate a flowering pot plant

GF10 Propagate plants from cuttings

GF11 Propagate plants by layerage

SUBCLUSTER: GREENHOUSE/FLORICULTURE

Sheet 1 of 1

TASK: Identify common cut flowers

Code: ANR > GF01

Student Name: _____

Student Progress				Behavioral Task Knowledges/Task Skills
Introduced	Involved	Productive	Employable	

Given the necessary tools, materials, equipment, and requisite knowledge, the learner will:

1. visually identify the following common cut flowers:
   a. Hybrid tea rose
   b. Floribunda rose
   c. Standard chrysanthemum
   d. Pompom chrysanthemum
   e. Fugii chrysanthemum
   f. Disbud chrysanthymem
   g. Regular carnation
   h. Miniature carnation
   i. Gladiolus
   j. Snapdragon
   k. Aster
   l. Stock
   m. Orchid
   n. Gardenia
   o. Tulip
   p. Iris
   q. Easter lily
   r. Daffodil.
2. describe typical uses for each of the flowers indicated.
3. identify the predominant color(s) of each flower.
4. describe the keeping quality of each flower.
5. identify the season for each flower.
6. identify the typical method of pricing each type of flower:
   a. by dozen
   b. by the stem or bud
   c. by bunches.

Instructional Methods

- Students review a series of teacher-made slides depicting examples of cut flowers.
- Student will learn to identify and describe the application of cut flowers through the performance of arranging tasks, also.
- Students organize a field trip to a local florist exchange.
- Students review illustrated texts and workbooks.

Task-Related Competencies	Instructional Materials		
	Title	Media	Bib.
KNOWLEDGE A 1,5,6	Series of slides (teacher-prepared)	11	
NUMBERS B 2b	Retail Flower Shop Operation and Management	13	17
APPLICATION C 2a,4,8	Exotica III	13	27
PHYSICAL D 1a,d,f 2a 3c	The Color Dictionary of Flowers and Plants	13	8

SUBCLUSTER: GREENHOUSE/FLORICULTURE

Code: ANR - GF01 TASK: Identify common cut flowers

Basic Information for Cooperative Teaching			Suggestions:
Language of the Task		Quantitative Concepts	
Rose	Disbud	Be able to count, measure in inches.	• Learn the flowers as they are in season or demand.
Chrysanthemum	Predominant		
Carnation			
Gladiola			
Snapdragon			
Aster			
Stock			
Orchid			
Gardenia			
Tulip			
Iris			
Easter lily			
Daffodil			
Miniature			

Supportive Instructional Materials:

SUBCLUSTER: GREENHOUSE/FLORICULTURE

Sheet 1 of 1

TASK: Identify common flowering pot plants

Code: ANR - GF02

Student Name: _____

Student Progress					Behavioral Task Knowledges/Task Skills	Instructional Methods
Introduced	Involved	Productive	Employable		Given the necessary tools, materials, equipment, and requisite knowledge, the learner will: 1. visually identify the following common flowering pot plants: a. Poinsettia b. Azalea c. Easter lily d. Chrysanthemum e. Geranium f. Hydrangia g. African violet h. Wax begonia i. Gloxinia j. Cyclamen. 2. describe the typical method of pricing each of these plants. 3. identify the predominant colors of each of these plants. 4. identify the season for each of these plants.	• Students organize a field trip to a local greenhouse. • Students will learn to identify the flowering pot plants through the performance of arranging task also. • Students review a series of teacher-made slides. • Students review illustrated workbook exercise.

Task-Related Competencies	Instructional Materials		
	Title	Media	Bib.
KNOWLEDGE A 9 NUMBERS B 2b APPLICATION C 2a, 4 PHYSICAL D 1a,d,f 2a 3c	Series of slides (teacher-made)	11	
	Retail Flower Shop Operation and Management	13	17

SUBCLUSTER: GREENHOUSE/FLORICULTURE

Code: ANB - GF02 TASK: Identify common flowering pot plants

Basic Information for Cooperative Teaching		Suggestions:
Language of the Task	Quantitative Concepts	
Poinsettia Azalea Easter lily Chrysanthemum Geranium Hydrangia African violet Wax begonia Gloxinia Cyclamen Colors - predominent	Multiplication Addition Pricing: if one is 78¢, how much are two by size of container by dozen or half dozen by weight	

Supportive Instructional Materials:

SUBCLUSTER: GREENHOUSE/FLORICULTURE

TASK: Identify common foliage plants and florist greens

Code: ANR - GF03

Student Name: _____

Student Progress	Behavioral Task Knowledges/Task Skills	Instructional Methods
Introduced / Involved / Productive / Employable	Given the necessary tools, materials, equipment, and requisite knowledge, the learner will: 1. visually identify the following common foliage plants and florist greens: a. Philodendron b. Philodendron panduriforme c. Philodendron dubium d. Split-leaf philodendron e. Variegated peperomia f. Watermelon begonia g. Dracaena sanderiana h. Dracaena godseffiana i. Dumbcane j. Roehr's dieffenbachia k. Patho's - devil's ivy l. Chinese evergreen m. Rubber plant n. Parlor palm o. Schefflera p. Philodendron Selloum q. Sansevieria r. Boston fern. 2. describe the color(s) of each of these plants. 3. describe the growth form of each: a. climbing d. tree-like b. trailing e. etc. c. erect 4. describe the leaf form of each: a. thick, oblong c. oval b. variegated d. narrow	• Students review a series of teacher prepared slides depicting common foliage plants and florist greens. • Students review illustrated texts. • Teacher organizes a field trip to a local greenhouse where students view foliage plants.

Task-Related Competencies	Instructional Materials		
	Title	Media	Bib.
KNOWLEDGE A 1,2,f	Exotica III	13	27
NUMBERS B 2b	Series of slides (teacher-made)	11	
APPLICATION C 2a,4			
PHYSICAL D 1a,d,f 2a 3c			

SUBCLUSTER: GREENHOUSE/FLORICULTURE

Code: ANR - GF03 TASK: Identify common foliage plants and florist greens

Basic Information for Cooperative Teaching		Suggestions:
Language of the Task	Quantitative Concepts	
Trailing Tree-like Foliage plants Erect Climbing Variegated Oval	Be able to count leaves. Visually recognize larger/smaller leaves or plantings.	

Supportive Instructional Materials:

SUBCLUSTER: GREENHOUSE/FLORICULTURE

Sheet 2 of 2

TASK: Identify common foliage plants and florist greens

Code: ANR - CF03

Student Name: _____

Student Progress					Behavioral Task Knowledges/Task Skills	Instructional Methods
Introduced	Involved	Productive	Employable		Given the necessary tools, materials, equipment, and requisite knowledge, the learner will: 5. identify (visually) the following forms of foliage commonly used in flower arranging: a. Salal or "lemon" b. Huckleberry c. White cedar d. English ivy e. Spiral eucalyptus f. Padocarpus g. Galax h. Laurel i. White pine j. Rhododendron k. Hemlock l. Asparagus fern m. Leatherleaf fern n. Jade palm o. Boxwood p. Emerald palm q. Ti leaves.	

Task-Related Competencies	Instructional Materials		
	Title	Media	Bib.
KNOWLEDGE A 1,5,6 NUMBERS B 2b APPLICATION C 2a,4 PHYSICAL D 1a,d,f 2a 3c			

SUBCLUSTER:

Code: ___ - ____ TASK:

Basic Information for Cooperative Teaching		Suggestions:
Language of the Task	Quantitative Concepts	

Supportive Instructional Materials:

SUBCLUSTER: GREENHOUSE/FLORICULTURE

Sheet 1 of 1

TASK: Apply the principles of design to flower arranging

Code: ANR - GF04

Student Name: _____

Student Progress	Behavioral Task Knowledges/Task Skills	Instructional Methods
Introduced / Involved / Productive / Employable	Given the necessary tools, materials, equipment, and requisite knowledge, the learner will: 1. identify examples of the following elements of design in flower arranging: a. line b. form c. pattern d. texture e. color. 2. understand and demonstrate the concept of color harmony in flower arrnagements. 3. understand and demonstrate the following design concepts in flower arranging: a. balance b. rhythm c. scale and proportion d. focal point e. harmony f. accent g. repetition h. unity	• Students view filmstrip on techniques of flower arranging and design. • Students review appropriate sections of illustrated texts. • Teacher or para-professional provides a demonstration, applying principles of design to a simple arrangement. • Students individually prepare a simple arrangement and evaluate it based upon the principles of design.

Task-Related Competencies	Instructional Materials		
	Title	Media	Bib.
KNOWLEDGE A 1,5,6 NUMBERS B 2b APPLICATION C 2a,4 PHYSICAL D 1a,d,f 2a 3c	Retail Flower Shop Operation and Management	13	17
	Professional Flower Arranging	13	18
	"Flower Arranging-Beginning Techniques"	10	18

SUBCLUSTER: GREENHOUSE/FLORICULTURE

Code: ANR - GE04 TASK: Apply the principles of design to flower arranging

Basic Information for Cooperative Teaching		Suggestions:
Language of the Task	Quantitative Concepts	• Close communication is essential to keeping supportive role relevant.
Line Form Pattern Texture Color Balance Rhythm Scale Focal point Harmony Repetition Unity	Color harmony Space relations	

Supportive Instructional Materials:

SUBCLUSTER: GREENHOUSE/FLORICULTURE

Sheet 1 of 1

TASK: Select floral holding devices, containers, and supplies

Code: ANR - GF05

Student Name: _____

Student Progress					Behavioral Task Knowledges/Task Skills	Instructional Methods
Introduced	Involved	Productive	Employable			
					Given the necessary tools, materials, equipment, and requisite knowledge, the learner will: 1. identify and demonstrate the use of the following holding devices commonly used by florists: a. pin holder b. chicken wire c. cage holder d. hair pin holder e. shredded styrofoam f. florist's clay g. bouquet holder h. chipped hydrofoam i. styrofoam bar j. hydrofoam. 2. identify and demonstrate the use of common supplies used frequently by florists: a. ribbons b. netting c. thread d. wire e. pipe cleaners f. spray paint g. tapes h. picks i. pins j. tubes.	• Students arrange and label a display of holding devices, containers, and supplies. • Students utilize holding devices and containers in preparing floral arrangements. • Para-professionals provide sustained involvement with students having difficulty with this task. • Teacher concentrates his efforts with students having difficulty.

Task-Related Competencies	Instructional Materials		
	Title	Media	Bib.
KNOWLEDGE A 1,5,6 NUMBERS B 2b APPLICATION C 2a,4 PHYSICAL D 1a,d,f 2a 3c	Retail Flower Shop Operation and Management	13	17

SUBCLUSTER: GREENHOUSE/FLORICULTURE

Code: ANR - GFO5 TASK: Select floral holding devices, containers, and supplies

Basic Information for Cooperative Teaching		Suggestions:
Language of the Task	Quantitative Concepts	
Netting Wire Florist tape Picks Pins Tubes	Wire in 18" lengths.	

Supportive Instructional Materials:

SUBCLUSTER: GREENHOUSE/FLORICULTURE

Sheet 1 of 1

TASK: Prepare home and hospital arrangements

Code: ANR - GF06

Student Name: _____

Student Progress				Behavioral Task Knowledges/Task Skills
Introduced	Involved	Productive	Employable	

Given the necessary tools, materials, equipment, and requisite knowledge, the learner will:

1. identify and describe the common types of arrangement designs:
   a. vertical
   b. horizontal
   c. symmetrical triangle
   d. right angle
   e. asymmetrical triangle.

2. select the flowers and materials needed for each design.

3. follow a prescribed procedure in preparing a home or hospital floral arrangement, employing each of the basic designs:
   a. vertical
   b. horizontal
   c. symmetrical triangle
   d. asymmetrical triangle
   e. right angle.

Instructional Methods

- Local florist visits class and demonstrates the procedures for preparing home and hospital floral arrangements.
- Students review F.T.D. and Teleflorist charts and handouts.
- Teacher encourages small peer group cooperation and interaction.
- Para-professionals provide sustained involvement with students having difficulty with this task.

Task-Related Competencies	Instructional Materials		
	Title	Media	Bib.
KNOWLEDGE A 1,5,6 NUMBERS B 2b APPLICATION C 2a,4 PHYSICAL D 1a,d,f 2a 3c	F.T.D. and Teleflorist charts and handouts	14 16	

SUBCLUSTER: GREENHOUSE/FLORICULTURE

Code: ANR - GF06 TASK: Prepare home and hospital arrangements

Basic Information for Cooperative Teaching		Suggestions:
Language of the Task	Quantitative Concepts	
Symmetrical Asymmetrical Vertical Horizontal	**Recognize right** angles. Recognize vertical and horizontal lines. Recognize lines at right angles.	

Supportive Instructional Materials:

SUBCLUSTER: GREENHOUSE/FLORICULTURE

TASK: Prepare wedding floral arrangements

Code: ANR- GF07

Student Name: _____

Student Progress				Behavioral Task Knowledges/Task Skills
Introduced	Involved	Productive	Employable	

Given the necessary tools, materials, equipment, and requisite knowledge, the learner will:

1. identify the different flower arrangements prepared for weddings:
   a. bridal bouquet
   b. attendant's bouquet
   c. corsages
   d. boutonnieres.
2. identify the different types of corsages:
   a. shoulder
   b. waist
   c. wrist
   d. hair.
3. follow a prescribed procedure in tying a corsage bow.
4. select quality flowers for a specific corsage.
5. follow a prescribed procedure in preparing a rose corsage:
   a. wiring and taping
   b. adding the backing
   c. assembling
   d. finishing.
6. follow a similar procedure for preparing:
   a. Cattleyea orchid
   b. Cymbidium orchid corsage
   c. Carnation corsage
   d. wedding bouquet
   e. boutonniere.

Instructional Methods

- Teacher and/or para-professional provide a demonstration in preparing different types of wedding arrangements.
- Students prepare individual wedding floral arrangements and display in school display area.
- Para-professionals provide sustained involvement with students having difficulty with this task.
- Teacher concentrates his effort with students having difficulty with this task.

Task-Related Competencies	Instructional Materials		
	Title	Media	Bib.
KNOWLEDGE A 1,5,6 NUMBERS B 2b APPLICATION C 2a,4 PHYSICAL D 1a,d,f 2a 3c	Retail Flower Shop Operation and Management	13	17

SUBCLUSTER: GREENHOUSE/FLORICULTURE

Code: ANR - GF07 TASK: Prepare wedding floral arrangements

Basic Information for Cooperative Teaching		Suggestions:
Language of the Task	Quantitative Concepts	
Bouquet Corsage Boutonnieres Wiring Taping Flowers Foliage Wires Stems Floral tape	Count and perform simple measuring problems.	• Ability to recognize balance and design are important.

Supportive Instructional Materials:

SUBCLUSTER: GREENHOUSE/FLORICULTURE

Sheet 1 of 1

TASK: Prepare funeral floral arrangements

Code: ANR- GF08

Student Name: _____

Student Progress				Behavioral Task Knowledges/Task Skills	Instructional Methods
Introduced	Involved	Productive	Employable	Given the necessary tools, materials, equipment, and requisite knowledge, the learner will : 1. identify the six different funeral floral designs: a. baskets b. sprays c. wreaths d. casket covers e. vases f. special designs. 2. select the foliage, flowers, containers, and materials needed for preparing: a. funeral baskets b. funeral sprays. 3. follow a prescribed procedure in preparing a funeral basket: a. prepare the containers b. establish the lines c. filling in d. establishing the focal point. 4. follow a prescribed procedure in preparing a funeral spray: a. select the holding device b. form the background c. prepare the gladioli spikes d. place the gladioli spikes e. filling in f. finishing.	• Students dismantle arrangements donated by funeral homes to study construction techniques. • Students review illustrated workbook. • Florist visits class and demonstrates the preparation of funeral arrangements.

Task-Related Competencies	Instructional Materials		
	Title	Media	Bib.
KNOWLEDGE A 1,5,6 NUMBERS B 2b APPLICATION C 2a,4 PHYSICAL D 1a,d,f 2a 3c	Retail Flower Shop Operation and Management	13	17

SUBCLUSTER: GREENHOUSE/FLORICULTURE

Code: ANR - GF08 TASK: Prepare funeral floral arrangements

Basic Information for Cooperative Teaching		Suggestions:
Language of the Task	Quantitative Concepts	• Visit a funeral home.
Baskets Sprays Wreaths Caskets Vases Funeral Focal point Spikes (glads)	Count items Measure length in inches Ability to visually identify common flower stem lengths	

Supportive Instructional Materials:

SUBCLUSTER: GREENHOUSE/FLORICULTURE

Sheet 1 of 1

TASK: Decorate a flowering pot plant

Code: ANR - GF09

Student Name: _____

Student Progress	Behavioral Task Knowledges/Task Skills	Instructional Methods
Introduced / Involved / Productive / Employable	Given the necessary tools, materials, equipment, and requisite knowledge, the learner will: 1. select the appropriate bow and ribbon for decorating a flowering pot plant. 2. tie an appropriate bow and wire it to a wooden pick. 3. wrap the pot in foil and place the bow pick at the pot edge.	• Students prepare plants for floral sale during holidays. • Teacher provides a basic demonstration on decoration of a flowering pot plant. • Para-professionals provide sustained involvement with students having difficulty with this task. • Teacher encourages small peer group cooperation and interaction.

Task-Related Competencies	Instructional Materials		
	Title	Media	Bib.
KNOWLEDGE			
NUMBERS			
APPLICATION			
PHYSICAL			

SUBCLUSTER: GREENHOUSE/FLORICULTURE

Code: ANR - GF09 TASK: Decorate a flowering pot plant

Basic Information for Cooperative Teaching		Suggestions:
Language of the Task	Quantitative Concepts	
Bow Ribbon Pot plant Pick Foil Wrap Decorate		• Check with vocational Greenhouse/ Floriculture instructor to determine supportive need.

Supportive Instructional Materials:

SUBCLUSTER: GREENHOUSE/FLORICULTURE

Sheet 1 of 1

TASK: Propagate plants from cuttings

Code: ANR- GF10

Student Name: _____

Student Progress				Behavioral Task Knowledges/Task Skills
Introduced	Involved	Productive	Employable	

Given the necessary tools, materials, equipment, and requisite knowledge, the learner will:

1. identify and describe the various types of stem cuttings.
2. list the essential factors for making and rooting cuttings.
3. demonstrate the techniques for cutting the various types of rooting.
4. prepare the cutting for planting/transplanting.
5. properly care for the cuttings during rooting.
6. identify, select, and use specific tools for cutting and rooting.

Instructional Methods

- Teacher provides demonstration of propagation by cutting.
- Students view a filmstrip on propagation of ornamental plants.
- Students review illustrated text.
- Para-professionals provide sustained involvement with students having difficulty with this task.

Task-Related Competencies	Instructional Materials		
	Title	Media	Bib.
KNOWLEDGE A 7,9 NUMBERS APPLICATION C 4,5,8 PHYSICAL D 1c,d 2d 3c,e,f	Plant Propagation	13	24
	"Propagating Ornamental Plants"	10	18

SUBCLUSTER: GREENHOUSE/FLORICULTURE

Code: ANR - GFLO TASK: Propagate plants from cuttings

Basic Information for Cooperative Teaching		Suggestions:
Language of the Task	Quantitative Concepts	• Take cutting in water in soil in artificial mix • Consult with vocational education instructor for experiments.
Cutting Knife Hormone Root Stem Flat Bench Soil Cut sand or masonary sand Perlite Vermiculite Mist systems Succulent Hardwood	Temperature Humidity Light	

Supportive Instructional Materials:

SUBCLUSTER: GREENHOUSE/FLORICULTURE

TASK: Propagate plants by layerage

Code: ANR - GF11

Student Name: _____

Student Progress	Behavioral Task Knowledges/Task Skills	Instructional Methods
Introduced / Involved / Productive / Employable	Given the necessary tools, materials, equipment, and requisite knowledge, the learner will: 1. identify and describe the basic purpose of the layerage process. 2. recognize the different types of layerage. 3. properly care for plants being layered. 4. recognize and regulate essential environmental conditions during the process. 5. identify and select the proper tools for layerage. 6. demonstrate a degree of skill in performing basic layerage.	• Teacher provides a basic demonstration of the procedures for propagating plants by layerage. • Para-professionals provide sustained involvement with students having difficulty with this task. • Teacher encourages small peer group cooperation and interaction. • Teacher concentrates his effort with students having difficulty.

Task-Related Competencies	Instructional Materials		
	Title	Media	Bib.
KNOWLEDGE A 7,9 NUMBERS APPLICATION C 4,5,8 PHYSICAL D 1c,d 2b 3c,e,f	Plant Propagation	13	

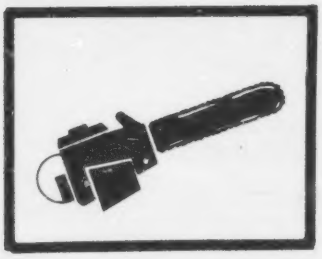
SUBCLUSTER: GREENHOUSE/FLORICULTURE

Code: ANR - GF11 TASK: Propagate plants by layerage

Basic Information for Cooperative Teaching		Suggestions:
Language of the Task	Quantitative Concepts	• Check with vocational Greenhouse/ Floriculture instructor to determine his greatest supportive need.
Layering Knives Rooting - compounds	Measure time in hours, days, weeks. Measure liquids in tsp., Tbsp., fractional parts of a cup, cup, pint, quart, gallon.	

Supportive Instructional Materials:

FORESTRY AND RECREATION



INSTRUCTIONAL TASK MODULES

FR01 Establish a woodland

FR02 Thin a tree stand

FR03 Improve a tree stand

FR04 Identify insect and disease damage

FR05 Use and field service forestry tools

FR06 Harvest stands

FR07 Cruise and measure a stand

FR08 Produce and harvest Christmas trees

FR09 Cut and prepare pulp wood

FR10 Identify forest management services

SUBCLUSTER: FORESTRY AND RECREATION

TASK: Establish a woodland

Code: ANR - FR01

Student Name: _____

Student Progress				Behavioral Task Knowledges/Task Skills
Introduced	Involved	Productive	Employable	

Given the necessary tools, materials, equipment, and requisite knowledge, the learner will:

1. select the proper species for planting.
2. determine the proper time for planting tree seedlings.
3. select appropriate sites for planting of tree seedlings.
4. properly care for the planting stock before planting.
5. hand plant seedlings by use of:
   a. mattock
   b. planting bar.

Instructional Methods

- Speaker from DNR visits the class and discusses woodland and establishment.
- Students participate in class planting projects during April-May.
- Students read and review illustrated bulletins.
- Teacher encourages small peer group cooperation and interaction.

Task-Related Competencies	Instructional Materials		
	Title	Media	Bib.
KNOWLEDGE A 6,7,9	Soil Conservation Service bulletins	14	
NUMBERS B 2b,4a,b,c	MSU Extension bulletins	14	28
APPLICATION C 2,4,5,8			
PHYSICAL D 1a,d,e,2b, 3a,c			

SUBCLUSTER: FORESTRY AND RECREATION

Code: ANR - FR01 TASK: Establish a woodland

Basic Information for Cooperative Teaching			Suggestions:
Language of the Task		Quantitative Concepts	
Seedlings	Rodmen	Pacing distances up to 100 ft.	Use foot-ball field for practice.
Planting	Chairman	Read rain gauge and moisture measuring instrument.	Success in this area depends to a large degree on a person's physical stamina, and his enthusiasm for outdoor living. A good supportive unit might be a study of outdoor living.
Mattock	Silviculture		
Planting bar			
Forest resources			
Forest crop			
Insect protection			
Scaling			
Marking			
Collecting			
Recording			
Rain gauge			
Stream flow			
Soil moisture			

Supportive Instructional Materials:

SUBCLUSTER: FORESTRY AND RECREATION

Sheet 1 of 1

TASK: Thin a tree stand

Code: ANR - FR02

Student Name: _____

Student Progress				Behavioral Task Knowledges/Task Skills
Introduced	Involved	Productive	Employable	

Given the necessary tools, materials, equipment, and requisite knowledge, the learner will:

1. describe the difference between a pure stand and a mixed stand.
2. describe the differences between an even-aged stand and an uneven-aged stand.
3. list several reasons or purposes for thinning a forest.
4. suggest a specific thinning technique for a specific stand.

Instructional Methods

- Teacher leads classroom instruction/discussion of thinning procedures and practices.
- Para-professional or teacher provides a demonstration of thinning practices in the woods.
- Teacher provides one-to-one instruction/application of thinning practices.

Task-Related Competencies	Instructional Materials		
	Title	Media	Bib.
KNOWLEDGE A 6,9 NUMBERS B 2b,4a APPLICATION C 2,5,8 PHYSICAL D 1a,d,e,2c, 3a			

SUBCLUSTER: FORESTRY AND RECREATION

Code: ANR - FR02 TASK: Thin a tree stand

Basic Information for Cooperative Teaching		Suggestions:
Language of the Task	Quantitative Concepts	• These students should also have good physical stamina, and be enthusiastic outdoors men as well as some basic knowledge for outdoor living.
Pure - stand Mixed stand Thinning Soil conservation	Determine the most desirable distances between different sized trees and teach the students to visually estimate these distances. It would be advisable also to estimate heights.	

Supportive Instructional Materials:

SUBCLUSTER: FORESTRY AND RECREATION

TASK: Improve a tree stand

Code: ANR - FR03

Student Name: _____

Student Progress				Behavioral Task Knowledges/Task Skills	Instructional Methods
Introduced	Involved	Productive	Employable	Given the necessary tools, materials, equipment, and requisite knowledge, the learner will: 1. describe and suggest several goals of stand improvement. 2. identify and describe five undesirable types of trees to be removed for stand improvement: a. wolf or spreading trees b. crooked trees c. trees with forked trunks d. overmature trees e. dead, damaged, or diseased tree. 3. read and interpret a stand table for stand improvement data.	• Teacher and students participate in a class discussion of stand improvement practices. • Para-professional or teacher provide a demonstration of improvement practices in the woods. • Teacher provides one-to-one instruction of improvement practices in the management of a small woodlot.

Task-Related Competencies	Instructional Materials		
	Title	Media	Bib.
KNOWLEDGE A 6,9 NUMBERS B 2b,4a,d,5 APPLICATION C 5,8 PHYSICAL D 1a,e,2c,3a,c			

SUBCLUSTER: FORESTRY AND RECREATION

Code: ANR - FR03 TASK: Improve a tree stand

Basic Information for Cooperative Teaching		Suggestions:
Language of the Task	Quantitative Concepts	• Again a person with physical stamina and an enthusiasm for outdoor living.
Wood lot Forked - trees Crooked - trees Spreading - trees Dead Damaged Diseased Herluside Inspection Plant quarantine Pest control laws	There would be a need for measuring either with measuring instruments and/or reliable estimations.	

Supportive Instructional Materials:

SUBCLUSTER: FORESTRY AND RECREATION

TASK: Identify insect and disease damage

Code: ANR - FR04

Student Name: _____

Student Progress				Behavioral Task Knowledges/Task Skills
Introduced	Involved	Productive	Employable	

Given the necessary tools, materials, equipment, and requisite knowledge, the learner will:

1. describe the major ways in which insects damage trees:
   a. defoliating
   b. tunneling under bark
   c. damaging tops and branches.

2. identify damage from the following insects:
   a. canker worms
   b. gypsy moth.

3. describe different ways in which diseases damage trees:
   a. killing or deforming
   b. decreasing growth rate
   c. destruction of heartwood.

4. identify tree damage caused by the following diseases:
   a. chestnut blight
   b. white pine blister rust
   c. oak wilt
   d. rot
   e. fomes annosus.

Instructional Methods

- o Teacher leads a brief classroom discussion.
- o Students interested in further information could pursue the topic on an independent study basis.
- o Students review illustrated materials.
- o DNR speaker visits class and discusses/analyzes insect and disease damaged trees.

Task-Related Competencies	Instructional Materials		
	Title	Media	Bib.
KNOWLEDGE A 6,8,9	Botany or biology text	13	
NUMBERS B 2b,3,8	Diseases and Pests of Ornamental Plants	13	21
APPLICATION C 2b,3,8			
PHYSICAL D 1a,c,d,e,2b, 3a,c			

SUBCLUSTER: FORESTRY AND RECREATION

Code: ANR - FR04 TASK: Identify insect and disease damage

Basic Information for Cooperative Teaching		Suggestions:
Language of the Task	Quantitative Concepts	
Beneficial Harmful blight rust wilt rot defoliating Heartwood Bark Growth rate Blister Rot Wilt Blight Parasite Pest	Aware of five diffences in plant growths, color, and texture. Aware, also, of five differences in relative body measurements of insects, worms etc. Ability to recognize the development of rots, blights, wilts, etc. as to involving a greater area.	Class communication with the Vocational Forestry and Recreation instructor, so supportive help can parallel the vocational need.

Supportive Instructional Materials:

SUBCLUSTER: FORESTRY AND RECREATION

TASK: Use and field service forestry tools

Code: ANR - FR05

Student Name: _____

Student Progress				Behavioral Task Knowledges/Task Skills	Instructional Methods
Introduced	Involved	Productive	Employable	Given the necessary tools, materials, equipment, and requisite knowledge, the learner will: 1. demonstrate the proper safety precautions to be followed in using an axe. 2. demonstrate the proper and efficient use of a wedge. 3. demonstrate the proper and efficient use of an axe. 4. demonstrate the proper and efficient use of a cant hook. 5. field service each of the tools so that additional field servicing cannot increase operation time or labor efficiency more than 50%.	• Para-professional provides classroom instruction/discussion of the use and servicing of forestry tools. • Students demonstrate field servicing procedures in the woods as well as the school lab. • Teacher encourages small peer group cooperation and interaction. • Teacher matches successful students who are interested in helping those having difficulty.

Task-Related Competencies	Instructional Materials		
	Title	Media	Bib.
KNOWLEDGE A	Quantity of hand implements	1	
NUMBERS			
APPLICATION			
PHYSICAL			

SUBCLUSTER: FORESTRY AND RECREATION

Code: DNR - FR05 TASK: Use and field service forestry tools

Basic Information for Cooperative Teaching		Suggestions:
Language of the Task	Quantitative Concepts	• Make early contact with the Vocational Forestry and Recreational Instructor so an attitude of safety can be effected ahead of the need for student involvement.
Axe Wedge "Safety" Cant hook Field service	2 cycle engines 1/2 pint oil per gallon gas	

Supportive Instructional Materials:

Resource person to talk on the need for Safety. That person should be one who has access to filmstrips, posters, and safety equipment.

SUBCLUSTER: FORESTRY AND RECREATION

Sheet 1 of 1

TASK: Harvest stands

Code: ANR - FR06

Student Name: _____

Student Progress				Behavioral Task Knowledges/Task Skills	Instructional Methods
Introduced	Involved	Productive	Employable	Given the necessary tools, materials, equipment, and requisite knowledge, the learner will: 1. describe the methods, purposes and advantages/disadvantages of the following harvesting practices: a. clearcutting b. seed-tree cutting c. shelterwood cutting d. selection cutting. 2. determine the proper harvesting practice for a given stand. 3. witness appropriate techniques/procedures in: a. clearcutting b. seed-tree cutting c. shelterwood cutting d. selection cutting.	• Teacher provides classroom instruction/discussion of harvesting practices, using MSU Extension Bulletins. • DNR representative speaks to class on the results of each harvesting method. • Students participate in a field trip to view the results of each method.

Task-Related Competencies	Instructional Materials		
	Title	Media	Bib.
KNOWLEDGE A 6,9	MSU Extension Bulletins	14	28
NUMBERS B			
APPLICATION C 5,8			
PHYSICAL D 1a,d,e,2c, 3a			

SUBCLUSTER: FOREST AND RECREATION

Code: ANR - FR06 TASK: Harvest stands

Basic Information for Cooperative Teaching		Suggestions:
Language of the Task	Quantitative Concepts	• Keep close contact with vocational forest and recreation instructor to determine the needs for supportive instruction.
Selective cutting Seed-tree Clear cutting Shelter wood Forest resources Soil conservation Forest conservation Wood level planning	Contact Vocational Forestry and Recreation instructor to determine need of area.	

Supportive Instructional Materials:

SUBCLUSTER: FORESTRY AND RECREATION

TASK: Cruise and measure a stand

Code: ANR - FR07

Student Name: _____

Student Progress					Behavioral Task Knowledges/Task Skills	Instructional Methods
Introduced	Involved	Productive	Employable		Given the necessary tools, materials, equipment, and requisite knowledge, the learner will: 1. use a log rule to determine the board measure of different sized logs and trees. 2. determine the height of a tree using a hypsometer. 3. describe the use of the International 1/4-Inch Log Rule. 4. determine the diameter and height of a tree using a cruiser's stick. 5. determine the number of 16-foot saw logs in a given tree using a cruiser's stick.	• Teacher provides instruction/discussion of how to use: a. Biltmore stick b. Merrit Hypsometer c. log scales. • Students gain practical experience by measuring trees on the school grounds. • DNR Representative speaks to class on the use of measuring sticks. • Students build their own Biltmore sticks.

Task-Related Competencies	Instructional Materials		
	Title	Media	Bib.
KNOWLEDGE A 9 NUMBERS B 2,4a,b,5,6 APPLICATION C 5,8 PHYSICAL D 1a,d,e,2c, 3a	Scaling and Cruising sticks	1	

SUBCLUSTER: FORESTRY AND RECREATION

Code: ANR - FR07 TASK: Cruise and measure a stand

Basic Information for Cooperative Teaching	
Language of the Task	Quantitative Concepts
Hypsometer Log rule Cruiser's stick International 1/4-in. log rule	Use of the log rule Measure linear distance up to 100 ft. Measure diameters in inches to 48". Develop the skill, if possible, of working with the International 1/4 inch Log Rule.

Suggestions:

- Keep close contact with the Forestry and Recreation vocational teacher to determine his area of greatest need for supportive teaching.

Supportive Instructional Materials:

SUBCLUSTER: FORESTRY AND RECREATION

Sheet 1 of 1

TASK: Produce and harvest Christmas trees

Code: ANR - FR08

Student Name: _____

Student Progress				Behavioral Task Knowledges/Task Skills
Introduced	Involved	Productive	Employable	

Given the recessary tools, materials, equipment, and requisite knowledge, the learner will:

1. list several of the characteristics desired in Christmas trees.
2. identify and describe several different species of Christmas trees:
   a. Scotch pine
   b. Austrian pine
   c. Spruce, white
   d. Spruce, Blue.
3. determine the appropriate spacing for a Christmas tree lot.
4. identify pest damage occurring from:
   a. ground hogs
   b. rabbits
   c. deer.
5. identify insects which have been destructive to commercial plantations in the local area.
6. tag and cut trees for seasonal sale.
7. arrange for the sale of trees to the local public.

Instructional Methods

- Students review Christmas tree bulletins.
- Students collect small samples of each type of tree.
- DNR representative speaks to class on Christmas tree spacing, pruning, care. etc.
- Teacher and students arrange a class project involving the cutting, tagging, and sale of trees.

Task-Related Competencies	Instructional Materials		
	Title	Media	Bib.
KNOWLEDGE A 6,8,9 NUMBERS B 2b,3,4a APPLICATION C 8 PHYSICAL D 1a,c,f,2c, 3c	MSU Christmas Tree bulletins	13	28

SUBCLUSTER: FORESTRY AND RECREATION

Code: ANR- FR08 TASK: Produce and harvest Christmas trees

Basic Information for Cooperative Teaching		Suggestions:
Language of the Task	Quantitative Concepts	• Use football field for practice. • Field trip to Christmas tree platform. • Observe and discuss points of interest.
Shape Color Odor Height Width Trim	Short-long needle Pacing distances up to 100 ft.	

Supportive Instructional Materials:

SUBCLUSTER: FORESTRY AND RECREATION

Sheet 1 of 1

TASK: Cut and prepare pulp wood

Code: ANR - FR09

Student Name: _____

Student Progress				Behavioral Task Knowledges/Task Skills	Instructional Methods
Introduced	Involved	Productive	Employable	Given the necessary tools, materials, equipment, and requisite knowledge, the learner will: 1. describe each of seven general specifications for pulpwood: a. species b. length c. diameter d. workmanship e. tree defects f. contamination g. bark. 2. select timber suitable for pulpwood. 3. prepare pulpwood from a woodlot thinning or improvement cutting operation. 4. operate a harvestor to perform: a. felling b. limbing c. bucking d. prehauling e. loading. 5. scale pulpwood by weight or volume to determine the number of cords in a given pile.	• The best method by far to facilitate comprehension of the material is to place the student on the job with an experienced individual who can work with that person on a one-to-one basis. • Student should keep a daily log/record of time duration and woodland activities.

Task-Related Competencies	Instructional Materials		
	Title	Media	Bib.
KNOWLEDGE A 6,9 NUMBERS B 4b APPLICATION C 3,5,8 PHYSICAL D 1a,c,d,e, 2c,3a,c			

SUBCLUSTER: FORESTRY AND RECREATION

Code: ANR- FR09 TASK: Cut and prepare pulp wood

Basic Information for Cooperative Teaching		Suggestions:
Language of the Task	Quantitative Concepts	• See vocational Forestry instructor to determine area of greatest need.
Timber Pulp tester Processing Pulpwood Scaling logs Marking trees	Recognize weights and volumns related to pulpwood lumber. Size of a cord of lumber.	

Supportive Instructional Materials:

SUBCLUSTER: FORESTRY AND RECREATION

Sheet 1 of 1

TASK: Identify forest management services

Code: ANR- FR10

Student Name: _____

Student Progress				Behavioral Task Knowledges/Task Skills	Instructional Methods
Introduced	Involved	Productive	Employable	Given the necessary tools, materials, equipment, and requisite knowledge, the learner will: 1. identify by name and describe the various forestry management services available from: a. DNR b. American Tree Farm System c. private consulting foresters d. forest product companies e. extension forestry f. soil conservation service.	• Guest speakers from local DNR and SCS speak to class on management services available through their offices. • Students organize a field trip to local DNR and SCS offices. • Students write for a quantity of free and inexpensive materials from Tree Farm and other organizations.

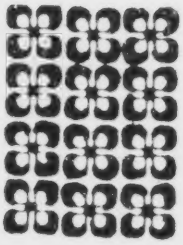
Task-Related Competencies	Instructional Materials		
	Title	Media	Bib.
KNOWLEDGE A 9 NUMBERS APPLICATION C 8 PHYSICAL D 1a,2b			

SUBCLUSTER: FORESTRY AND RECREATION

Code: ANR - FR10 TASK: Identify forest management services

Basic Information for Cooperative Teaching		Suggestions:
Language of the Task	Quantitative Concepts	
Soil classification producing crops producing grasses producing trees Peat Soil use Land line Field boundaries Physical properties Chemical properties Water relationship Soil conservation Soil deterioration Erode Deplete	Measuring distance, heights, and etc.	

Supportive Instructional Materials:



INSTRUCTIONAL MATERIALS BIBLIOGRAPHY

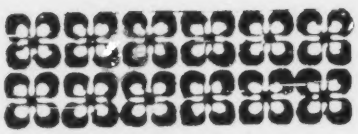
INSTRUCTIONAL MATERIALS BIBLIOGRAPHY

AGRICULTURE/NATURAL RESOURCES CLUSTER

Bib. Ref. No.	Company Name/Address	Title
1.	Allen Electric Kalamazoo, Michigan	"Engine Components" "Cooling System" "Ignition System" "Cranking System" "Fuel System" "Electricity" "Charging System" "Internal Combustion Engine"
2.	Allis Chalmers Company (see local farm equipment dealer for exact address and ordering information)	"Big Acre Handling of Hay and Forage Crops" "The Business of Gleaning"
3.	Association Sterling Films 866 Third Avenue New York, New York 10022	"Pesticides - Fundamentals of Proper Application"
4.	Oxford University Press 200 Madison Avenue New York, New York 10016	Free Maintenance
5.	Prentice-Hall Inc. Englewood Cliffs, N.J. 07632	Plant Propagation - Principles and Practices
6.	DCA Educational Products, Inc. 4865 Stenton Avenue Philadelphia, Pa 19144	Automotive Mechanics (twelve sections of transparencies)
7.	Delco-Remy Corporation Division of GMC Anderson, Indiana	Flip charts for Auto Mechanics
8.	Crown Publishers Inc. 419 Park Avenue South New York, New York 10016	The Color Dictionary of Flowers and Plants
9.	Farm Film Foundation 1425 H Street, N.W. Washington, D.C.	"Golden Touch" "Balanced Head Mower" "Irrigation and the Business of Farming"
10.	Gehl Company (see local farm equipment dealer for exact address and ordering information)	"New Formula for Forage Handling"

11.	Interstate Printers and Publishers 19-27 North Jackson Street Danville, Illinois 61832	"Fifty Lab Exercises for Vocational Ornamental Horticulture Students" Flower and Plant Productio in the Greenhouse
12.	Jam Handy School Service 2781 E. Grand Boulevard Detroit, Michigan 48211	Automotive Technician Series #4300
13.	Maine Department of Agriculture Augusta, Maine 04330	"Apples Away"
14.	McGraw-Hill Book Company Gregg Division 330 West 42nd Street New York, N.Y.	Commercial Flower Forcing
15.	New Holland (see local farm equipment dealer for exact address and ordering information)	"Baled Hay"
16.	Package Research Lab.	"Adventures in Agricultura Automated Packing Housin
17.	Pennsylvania State University Department of Agricultural Education University Park, Pa 16802	Retail Flower Shop Operati and Management Teacher's Manual $2.50 Student's Manual $2.50 Turf Maintenance and Establishment Teacher's Manual $2.50 Student's Manual $2.25 Greenhouse Crop Production Teacher's Manual $3.00 Student's Manual $2.75 Landscape Maintenance and Establishment Teacher's Manual $2.50 Student's Manual $2.00 Landscape Design Teacher's Manual $2.25 Student's Manual $2.00 "Commonly Used Trees, Shru Groundcovers, and Vines" (slides)

18.	Vocational Education Productions California Polytechnic State University San Luis Obispo, Ca 93401	Professional Flower Arranging "Flower Arranging-Beginning Techniques" "Lawns and Groundcovers" "Propagating Ornamental Plants" "Budding and Grafting" Insect Identification Manual Experiments in Soil Science "Controlling Pests of Ornamental Plants"
19.	Sealed Power Corp. 2001 Sanford Street Muskegon, Michigan 49443	"Engine Breakdown"
20.	Shell Film Library Shell Oil Company 50 West 50th Street New York, N.Y. 10020	"The Living Soil"
21.	The Ronald Press Co. 79 Madison Avenue New York, N.Y. 10016	Diseases and Pests of Ornamental Plants
22.	Minnesota Mining and Manufacturing Co. 2501 Hudson Road St. Paul, Minnesota	Automotive Master Transparencies Ignition System
23.	William Morrow and Co. 105 Madison Avenue New York, N.Y. 10016	How to Prune Almost Everything
24.	Vernard Film Distribution Service 113 NE Madison Avenue Peoria, Illinois 61602	"The Magic of Harvestor Storage"
25.	Vocation Agriculture Service	"Fertilizing and Watering Shade and Ornamental Trees"
26.	George J. Ball, Inc.	Ball Red Book
27.	Roehrs Company Book Division Box 125 East Rutherford, N.J. 07073	Exotica III
28.	MSU Agricultural Extension Service Michigan State University East Lansing, Michigan 48823	variety of brochures and booklets
29.	The Macmillan Publishing Company 866 Third Avenue New York, N.Y. 10022	The Pruning Manual Plant Propagation Practices



APPENDIX

INSTRUCTIONAL MATERIALS CODE

MEDIA CODE/INDEX

Code	Media	Probable Learning Sensations					
		Vis.	Aud.	Tac.	Kin.	Ole.	Sav.
1	Demonstration with real objects/materials	x	x	x	x	x	x
2	3-D models - Mockups	x	x	x	x	x	x
3	Games - Simulators	x	x	x	x	x	x
4	Sound/Slide Programs	x	x				
5	Filmstrip - Cassette/Record	x	x				
6	TV - Broadcast, Closed Circuit	x	x				
7	Video and/or Audio Recorder	x	x				
8	Film, 16mm - BW/Color, Sound	x	x				
9	Film loop, 8mm	x					
10	Filmstrip	x					
11	Slides	x					
12	Overhead transparencies	x					
13	Books, Magazines, Texts, Booklets	x					
14	Pamphlets, Brochures, Manuals, Workbooks	x					
15	Newspapers, Cartoons	x					
16	2-D Displays, Charts, Graphs, Posters	x					
17	Drawings, Photographs, Schematics, Maps	x					
18	Opaque Projectuals	x					
19	Telephone, Intercom		x				
20	Other, specify						

BIBLIOGRAPHY REFERENCE

. . . complete ordering information for each of the commercially or teacher-produced instructional materials may be obtained by checking this reference number in the Instructional Materials Bibliography located in the back of the Cluster Guide.

TASK-RELATED COMPETENCIES

The task-related competencies are a summation of the specific skills, understandings, and/or attitudes that are necessary to satisfactorily accomplish the instructional tasks found in the ten cluster guides. The following listing is used for interpreting the Task-Related Competency code numbers found on each task sheet. A more detailed description of each of the identified competencies can be found either in the Program Guide or the Project Handbook.

A. SKILLS BASED ON KNOWLEDGE

1. Name one or more items
2. Request supplies and/or equipment
3. Check for accuracy and, if necessary, require correction of self and/or others
4. Discriminate sound cues, recognize normal sound as opposed to abnormal sound
5. Identify color
6. Identify form, size, shape, texture
7. Sequencing - Respond by pre-determined plan
8. Write identifying information of persons, places, and/or objects, serial no., weight, and/or types of products on slips or tags, etc.
9. Obtain information through sight, shape, size, distance, motion, color, and other unique characteristics
10. Discriminate olfactory cues

B. CONCEPT OF NUMBERS BASED ON KNOWLEDGE

1. Ordinal
2. Cardinal
   a. read numbers and/or copy
   b. count and/or record
3. Make change (money)
4. Measure
   a. distance
   b. weights - volume - balance
   c. liquids - solids
   d. time (measurement of)
   e. degrees of circle
   f. temperature, pressure and humidity
   g. torque
   h. electricity
   i. vertical-horizontal
5. Perform simple addition and/or subtraction
6. Perform simple multiplication and/or division

TASK-RELATED COMPETENCIES, continued. . .

C. COMPREHENSION AND PERFORMANCE

1. Forms
   a. write
   b. file, post and/or mail
2. Match
   a. duplicate
   b. sort
3. Check lists and/or fill out report forms
4. Time awareness
5. Follow verbal symbol and/or written direction
6. Recognize words (not numbers) or ability to read and/or write
7. Depth perception
8. Ability to select most appropriate solution
9. Concept of distance

D. SKILLS BASED ON PHYSICAL ABILITIES

1. Fine Coordination
   a. coordinate eyes and hands or fingers accurately
   b. make precise movement
   c. move fingers to manipulate objects
   d. move hands skillfully - placing and turning motion
   e. coordinate hand and foot
   f. feeling - perceiving objects and materials as to size, shape, temperature, moisture content, or texture by means of touch
2. Strength (lifting, carrying, pushing, and/or pulling)
   a. sedentary work, 10# occasionally lifting and/or carrying small items such as tools, etc.
   b. light work, 20#, requires a significant amount of standing or walking
   c. medium work, lifting 50#, frequent lifting and carrying objects weighing 25#
   d. heavy work, frequent lifting and/or carrying up to 50#
   e. very heavy work - lifting objects in excess 100#, lifting and/or carrying objects weighing 50# or more
3. Gross Coordination (climbing and/or balancing)
   a. maintain body equilibrium to prevent falling when walking, standing, crouching, or running on narrow, slippery or moving surfaces
   b. ascend and descend ladders, scairs, scaffolding, ramps, poles, ropes, using feet and legs and/or hands and arms
   c. reaching - extending hands and arms in any direction
   d. crawling - moving on knees or hands and feet
   e. kneeling - bend legs at knees to rest on knee or knees
   f. stooping - bend downward and forward by bending legs and spine
   g. bending - downward and forward by bending at the waist